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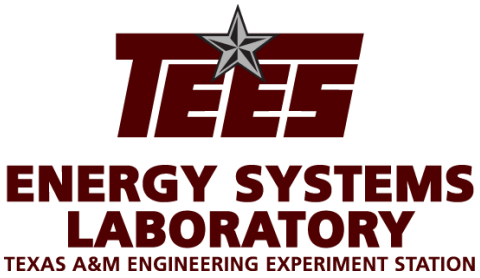

TAMU Project

Energy Consumption Data Quality Assurance/Quality Control Assessment Report for the

Month of May 2016

Prepared for

Utility & Energy Services

Division of Administration

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Executive Summary

This report analyzes the energy use data collected from 567 meters in 190 buildings and complexes (approximately 17,100,000 GSF) on the campus of Texas A&M University in College Station, Texas. The report consists of five sections: 1) The summary of the monthly energy consumption per meter ID, 2) The quality control and assurance analysis of incorrect or incomplete energy use patterns, 3) Energy consumption time series plots, 4) Energy Balance plots, and 5) Energy Balance plots with filled-in consumption data. Section one contains the summary of monthly energy consumption for each of the TAMU buildings. Section two includes the reviews on each of those building energy use patterns that presented problems in the metered data. Section three and four are a collection of the plots generated for the energy use analysis, as reference to indicate and validate the quality of the metered energy data. The Section five includes the energy balance plots with filled-in energy data.

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I. Summary of Monthly Consumption

Table I-1 May 2016 Monthly Consumption for TAMU Buildings

TAMU#	Building Name	Area (ft^2)	MeterID	Type	Monthly Consumption	Units	Comments
0270	Emerging Technologies Building	305,316	007469	ELE	194,404	kWh	
0270	Emerging Technologies Building	305,316	007470	ELE	49,528	kWh	
0270	Emerging Technologies Building	305,316	007471	CHW	2,438,945	mBtu	
0270	Emerging Technologies Building	305,316	007475	HHW	250,861	mBtu	
0275	Liberal Arts and Arts & Humanities Building	107,500	007715	ELE	56,644	kWh	
0275	Liberal Arts and Arts & Humanities Building	107,500	007716	CHW	464,528	mBtu	
0275	Liberal Arts and Arts & Humanities Building	107,500	007717	HHW	57,110	mBtu	
0290	Wells Residence Hall	67,283	006870	ELE	36,056	kWh	
0290	Wells Residence Hall	67,283	001984	CHW	830,436	mBtu	(2)
0290	Wells Residence Hall	67,283	001988	HHW	427,796	mBtu	(2)
0291	Rudder Residence Hall	67,283	000351	ELE	47,572	kWh	
0291	Rudder Residence Hall	67,283	002132	CHW	829,736	mBtu	(2)
0291	Rudder Residence Hall	67,283	002136	HHW	409,854	mBtu	(2)
0292	Eppright Residence Hall	67,283	000002	ELE	45,909	kWh	
0292	Eppright Residence Hall	67,283	002262	CHW	703,481	mBtu	#, (1)
0292	Eppright Residence Hall	67,283	002266	HHW	254,923	mBtu	#, (1)
0293	Appelt Residence Hall	82,767	000003	ELE	48,107	kWh	
0293	Appelt Residence Hall	82,767	002062	CHW	856,881	mBtu	(2)
0293	Appelt Residence Hall	82,767	002066	HHW	412,809	mBtu	(2)
0294	Lechner Residence Hall	59,541	000004	ELE	40,628	kWh	(2)
0294	Lechner Residence Hall	59,541	002285	CHW	739,330	mBtu	(2)
0294	Lechner Residence Hall	59,541	002289	HHW	599,538	mBtu	(2)
0296-0297	Mitchell Inst. For Fundamental Phys & Astronomy	189,617	006536	ELE	128,471	kWh	
0296-0297	Mitchell Inst. For Fundamental Phys & Astronomy	189,617	006537	ELE	107,605	kWh	
0296-0297	Mitchell Inst. For Fundamental Phys & Astronomy	189,617	006534	CHW	1,153,808	mBtu	
0296-0297	Mitchell Inst. For Fundamental Phys & Astronomy	189,617	006535	HHW	205,059	mBtu	
0353	Bright Aerospace Building	148,837	001569	ELE	148,913	kWh	
0353	Bright Aerospace Building	148,837	002746	CHW	1,162,235	mBtu	(2)
0353	Bright Aerospace Building	148,837	002757	HHW	56,742	mBtu	(2)
0358	Davis Football Player Development Center	20,026	007699	ELE	26,559	kWh	
0358	Davis Football Player Development Center	20,026	007701	CHW	188,291	mBtu	
0358	Davis Football Player Development Center	20,026	007702	HHW	3,291	mBtu	
0361	Bright Football Complex	124,971	008461	ELE	224,206	kWh	*
0361	Bright Football Complex	124,971	002547	CHW	1,140,433	mBtu	
0361	Bright Football Complex	124,971	002551	HHW	148,078	mBtu	
0367	Kyle Field	489,000	000336	ELE	158,819	kWh	
0367	Kyle Field	489,000	008861	ELE	90,793	kWh	
0367	Kyle Field	489,000	008862	ELE	103,399	kWh	
0367	Kyle Field	489,000	008863	ELE	164,074	kWh	
0367	Kyle Field	489,000	008864	ELE	176,508	kWh	
0367	Kyle Field	489,000	008865	ELE	71,946	kWh	
0367	Kyle Field	489,000	008866	ELE	155,766	kWh	
0367	Kyle Field	489,000	008867	ELE	199,409	kWh	
0367	Kyle Field	489,000	008868	ELE	87,514	kWh	
0367	Kyle Field	489,000	008852	CHW	2,734,399	mBtu	
0367	Kyle Field	489,000	008026	CHW	3,304,692	mBtu	
0367	Kyle Field	489,000	008856	HHW	449,369	mBtu	
0367	Kyle Field	489,000	008027	HHW	811,897	mBtu	
0376	Chemistry Building Addition	115,797	006229	ELE	206,141	kWh	
0376	Chemistry Building Addition	115,797	006230	ELE	115,134	kWh	
0376	Chemistry Building Addition	115,797	007115	CHW	3,817,744	mBtu	
0376	Chemistry Building Addition	115,797	007119	HHW	1,180,611	mBtu	
0383	Koldus Building	110,272	001488	ELE	158,098	kWh	
0383	Koldus Building	110,272	002863	CHW	641,225	mBtu	
0383	Koldus Building	110,272	002874	HHW	63,808	mBtu	
0384	Sanders Corps of Cadets Center	19,363	001554	ELE	22,410	kWh	
0384	Sanders Corps of Cadets Center	19,363	002583	CHW	210,789	mBtu	#, (1)
0384	Sanders Corps of Cadets Center	19,363	002587	HHW	89,361	mBtu	#, (1)
0325-0385	CE TTI Office & Lab Building	157,844	009122	ELE	176,860	kWh	
0325-0385	CE TTI Office & Lab Building	157,844	009123	CHW	1,202,910	mBtu	
0325-0385	CE TTI Office & Lab Building	157,844	009124	HHW	119,090	mBtu	
0385-A	CE TTI Office & Lab Building - Pi R Square	9,393	004240	CHW	56,765	mBtu	
0385-A	CE TTI Office & Lab Building - Pi R Square	9,393	004245	HHW	10,494	mBtu	

Table I-1 May 2016 Monthly Consumption for TAMU Buildings (*Continued*)

TAMU#	Building Name	Area (ft^2)	MeterID	Type	Monthly Consumption	Units	Comments
0386	Jack E. Brown Chemical Engineering Building	205,000	001428	ELE	186,800	kWh	
0386	Jack E. Brown Chemical Engineering Building	205,000	001429	ELE	361,471	kWh	
0386	Jack E. Brown Chemical Engineering Building	205,000	002250	CHW	4,139,652	mBtu	
0386	Jack E. Brown Chemical Engineering Building	205,000	006871	CHW	106,424	mBtu	
0386	Jack E. Brown Chemical Engineering Building	205,000	002254	HHW	523,911	mBtu	
0387	Richardson Petroleum Engineering Building	113,700	005870	ELE	85,885	kWh	
0387	Richardson Petroleum Engineering Building	113,700	005872	ELE	106,674	kWh	
0387	Richardson Petroleum Engineering Building	113,700	005805	CHW	1,291,233	mBtu	
0387	Richardson Petroleum Engineering Building	113,700	005809	HHW	187,825	mBtu	
0391-0392	James J. Cain'51 and Mechanical Engineering Office Building	173,481	001573	ELE	193,347	kWh	
0391-0392	James J. Cain'51 and Mechanical Engineering Office Building	173,481	002906	CHW	1,353,490	mBtu	
0391-0392	James J. Cain'51 and Mechanical Engineering Office Building	173,481	002910	HHW	194,668	mBtu	
0394	Underwood Residence Hall	81,730	000014	ELE	25,002	kWh	(2)
0394	Underwood Residence Hall	81,730	002117	CHW	836,570	mBtu	*, (1), (2)
0394	Underwood Residence Hall	81,730	002121	HHW	647,160	mBtu	*, (1), (2)
0398	Langford Architecture Center Building A	116,619	003806	ELE	95,043	kWh	
0398	Langford Architecture Center Building A	116,619	003951	CHW	1,144,119	mBtu	
0398	Langford Architecture Center Building A	116,619	003955	HHW	540,967	mBtu	
0400	Spence Hall Dorm 1	31,952	009169	ELE	NA	kWh	*
0400	Spence Hall Dorm 1	31,952	009170	CHW	361,954	mBtu	*
0400	Spence Hall Dorm 1	31,952	009171	HHW	148,640	mBtu	*
0401	Kiest Hall Dorm 2	35,967	009150	ELE	NA	kWh	*
0401	Kiest Hall Dorm 2	35,967	009151	CHW	726,293	mBtu	*
0401	Kiest Hall Dorm 2	35,967	009152	HHW	466,410	mBtu	*
0402	Briggs Hall Dorm 3	32,139	009205	ELE	NA	kWh	*
0402	Briggs Hall Dorm 3	32,139	009206	CHW	306,931	mBtu	*
0402	Briggs Hall Dorm 3	32,139	009207	HHW	119,609	mBtu	*
0403	Fountain Hall Dorm 4	36,893	092222	ELE	NA	kWh	*
0403	Fountain Hall Dorm 4	36,893	009223	CHW	573,491	mBtu	*
0403	Fountain Hall Dorm 5	36,893	009224	HHW	454,347	mBtu	*
0404	Gainer Hall Dorm 5	33,904	009227	ELE	NA	kWh	*
0404	Gainer Hall Dorm 5	33,904	009228	CHW	10,469	mBtu	*
0404	Gainer Hall Dorm 5	33,904	009229	HHW	8,846	mBtu	*
0405-0407-1402	Lacy Hall - Dorm 6, Harrell Hall and Leadership Learning Center	91,310	007721	ELE	65,271	kWh	
0407-1402	Harrell Hall - Dorm 8 and Buzbee LLC	54,443	007722	CHW	460,181	mBtu	
0407-1402	Harrell Hall - Dorm 8 and Buzbee LLC	54,443	007723	HHW	62,412	mBtu	
0405	Lacy Hall - Dorm 6	36,867	007922	ELE	22,599	kWh	
0405	Lacy Hall - Dorm 6	36,867	007918	CHW	341,087	mBtu	#, (1)
0405	Lacy Hall - Dorm 6	36,867	007919	HHW	89,947	mBtu	
0407	Harrell Hall - Dorm 8	36,943	007729	ELE	24,962	kWh	
1402	Buzbee Leadership Learning Center	17,500	007725	CHW	170,854	mBtu	
1402	Buzbee Leadership Learning Center	17,500	007726	HHW	1,368	mBtu	
0406-1403	Leonard Hall - Dorm 7 and Ash LLC	54,179	007981	ELE	49,965	kWh	
0406-1403	Leonard Hall - Dorm 7 and Ash LLC	54,179	007982	CHW	467,013	mBtu	
0406-1403	Leonard Hall - Dorm 7 and Ash LLC	54,179	007983	HHW	82,662	mBtu	
0406	Leonard Hall - Dorm 7	36,893	008011	ELE	11,072	kWh	
0406	Leonard Hall - Dorm 7	36,893	008012	ELE	12,025	kWh	
1403	H. Grady Ash, Jr. '58 Leadership Learning Center	17,286	008005	CHW	137,917	mBtu	
1403	H. Grady Ash, Jr. '58 Leadership Learning Center	17,286	008006	HHW	11,353	mBtu	
0408	Whitely Hall - Dorm 9	36,893	000024	ELE	26,156	kWh	*
0408	Whitely Hall - Dorm 9	36,893	002079	CHW	393,621	mBtu	*, #, (1)
0408	Whitely Hall - Dorm 9	36,893	002083	HHW	156,103	mBtu	*, #, (1)
0409	White Hall - Dorm 10	36,893	000025	ELE	22,663	kWh	*
0409	White Hall - Dorm 10	36,893	002094	CHW	343,549	mBtu	*
0409	White Hall - Dorm 10	36,893	002098	HHW	138,574	mBtu	*
0410	Harrington Hall - Dorm 11	36,893	000327	ELE	20,138	kWh	*
0410	Harrington Hall - Dorm 11	36,893	002349	CHW	339,271	mBtu	*, #, (1)
0410	Harrington Hall - Dorm 11	36,893	002353	HHW	115,623	mBtu	*, #, (1)
0411	Utay Hall - Dorm 12	36,943	000026	ELE	28,127	kWh	*
0411	Utay Hall - Dorm 12	36,943	002102	CHW	257,455	mBtu	*
0411	Utay Hall - Dorm 12	36,943	002106	HHW	96,482	mBtu	*
0412	Moses Residence Hall	40,828	000027	ELE	29,128	kWh	
0412	Moses Residence Hall	40,828	002384	CHW	551,307	mBtu	(2)
0412	Moses Residence Hall	40,828	002395	HHW	198,438	mBtu	
0415	Davis-Gary Residence Hall	40,828	000030	ELE	26,798	kWh	
0415	Davis-Gary Residence Hall	40,828	002532	CHW	539,352	mBtu	
0415	Davis-Gary Residence Hall	40,828	002543	HHW	202,580	mBtu	
0419	Legett Residence Hall	45,134	000031	ELE	17,144	kWh	*
0419	Legett Residence Hall	45,134	002218	CHW	225,033	mBtu	*
0419	Legett Residence Hall	45,134	002222	HHW	80,535	mBtu	*

Table I-1 May 2016 Monthly Consumption for TAMU Buildings (*Continued*)

TAMU#	Building Name	Area (ft^2)	MeterID	Type	Monthly Consumption	Units	Comments
0420	Milner Hall	48,268	009144	ELE	19,971	kWh	
0420	Milner Hall	48,268	009145	CHW	166,337	mBtu	
0420	Milner Hall	48,268	009146	HHW	16,145	mBtu	
0422	Walton Residence Hall	51,494	000378	ELE	56,545	kWh	
0422	Walton Residence Hall	51,494	002364	HHW	55,041	mBtu	
0424	Hotard Hall	18,500	000032	ELE	13,085	kWh	
0424	Hotard Hall	18,500	002657	CHW	125,999	mBtu	
0424	Hotard Hall	18,500	002668	HHW	45,068	mBtu	
0425	Henderson Hall	22,185	001553	ELE	15,124	kWh	
0425	Henderson Hall	22,185	002607	CHW	256,950	mBtu	
0425	Henderson Hall	22,185	002611	HHW	101,437	mBtu	
0426-0427-0428	FHK Complex	154,349	000331	ELE	100,003	kWh	
0426-0427-0428	FHK Complex	154,349	002848	CHW	1,271,728	mBtu	
0426-0427-0428	FHK Complex	154,349	002859	HHW	475,117	mBtu	
0430	Schumacher Residence Hall	38,957	000034	ELE	29,294	kWh	
0430	Schumacher Residence Hall	38,957	002015	CHW	358,588	mBtu	
0430	Schumacher Residence Hall	38,957	002030	HHW	80,315	mBtu	
0359	Architecture Building B	28,545	005518	ELE	23,151	kWh	
0432	Architecture Building C	73,020	005584	ELE	73,895	kWh	
0359-0432	Architecture Building B&C	101,565	006419	CHW	688,854	mBtu	
0359-0432	Architecture Building B&C	101,565	006423	HHW	244,878	mBtu	
0434	Luedecke Building (Cyclotron)	80,646	005555	ELE	171,603	kWh	
0434	Luedecke Building (Cyclotron)	80,646	005558	ELE	1,008,322	kWh	
0434	Luedecke Building (Cyclotron)	80,646	006664	CHW	1,790,492	mBtu	
0434	Luedecke Building (Cyclotron)	80,646	006668	HHW	71,955	mBtu	
0435	Harrington Education Center Office Tower	130,844	001546	ELE	112,768	kWh	
0435	Harrington Education Center Office Tower	130,844	002792	CHW	909,192	mBtu	
0435	Harrington Education Center Office Tower	130,844	002796	HHW	371,889	mBtu	
0436	Reed-McDonald Building	77,435	006868	ELE	89,482	kWh	
0436	Reed-McDonald Building	77,435	002419	CHW	1,331,716	mBtu	
0436	Reed-McDonald Building	77,435	002423	HHW	293,149	mBtu	
0438	Harrington Education Center Classroom Building	61,860	003630	ELE	29,829	kWh	
0438	Harrington Education Center Classroom Building	61,860	002784	CHW	168,206	mBtu	
0438	Harrington Education Center Classroom Building	61,860	002788	HHW	706	mBtu	
0433-0440-0441-04	Mosher Commons Krueger Dunn Aston	577,584	009099	ELE	332,816	kWh	
0433	Mosher Residence Hall	155,430	009083	ELE	83,577	kWh	(2)
0433	Mosher Residence Hall	155,430	002485	CHW	1,942,931	mBtu	
0433	Mosher Residence Hall	155,430	002489	HHW	798,692	mBtu	(2)
0441	Krueger Residence Hall	112,133	009091	ELE	98,150	kWh	
0441	Krueger Residence Hall	112,133	002504	CHW	1,022,557	mBtu	#, (1)
0441	Krueger Residence Hall	112,133	002500	HHW	382,158	mBtu	#, (1)
0442	Dunn Residence Hall	112,133	009095	ELE	89,303	kWh	
0442	Dunn Residence Hall	112,133	002519	CHW	934,026	mBtu	
0442	Dunn Residence Hall	112,133	002515	HHW	375,414	mBtu	
0447	Aston Residence Hall	113,388	009087	ELE	61,492	kWh	
0447	Aston Residence Hall	113,388	002474	CHW	1,092,988	mBtu	
0447	Aston Residence Hall	113,388	002470	HHW	537,815	mBtu	
0443	Oceanography & Meteorology Building	180,316	005322	ELE	176,491	kWh	
0443	Oceanography & Meteorology Building	180,316	005323	ELE	62,130	kWh	
0443	Oceanography & Meteorology Building	180,316	006388	CHW	1,192,784	mBtu	
0443	Oceanography & Meteorology Building	180,316	006392	HHW	455,471	mBtu	
0444	Peterson Building	84,831	004714	ELE	143,383	kWh	#, (1)
0444	Peterson Building	84,831	002922	CHW	1,177,741	mBtu	*
0444	Peterson Building	84,831	006435	HHW	269,006	mBtu	*
0445-0517	Teague Research Center and DPC Annex	89,735	003948	ELE	29,949	kWh	
0445-0517	Teague Research Center and DPC Annex	89,735	004719	ELE	53,069	kWh	
0445	Teague Research Center	63,515	006411	CHW	314,141	mBtu	
0445	Teague Research Center	63,515	006415	HHW	25,817	mBtu	
0517	DPC Annex	26,220	006563	CHW	539,992	mBtu	
0517	DPC Annex	26,220	006567	HHW	296,438	mBtu	
0446	Rudder Theatre Complex	209,293	002977	ELE	107,441	kWh	
0446	Rudder Theatre Complex	209,293	002980	ELE	39,366	kWh	
0446	Rudder Theatre Complex	209,293	004297	CHW	1,681,148	mBtu	
0446	Rudder Theatre Complex	209,293	004309	HHW	631,681	mBtu	
0446	Rudder Tower	92,947	001550	ELE	30,463	kWh	
0446	Rudder Tower	92,947	001551	ELE	59,655	kWh	
0446	Rudder Tower	92,947	002455	CHW	603,678	mBtu	
0446	Rudder Tower	92,947	002459	HHW	64,248	mBtu	
0448	Adams Band Hall	55,248	000978	ELE	59,761	kWh	
0448	Adams Band Hall	55,248	002555	CHW	517,944	mBtu	
0448	Adams Band Hall	55,248	002566	HHW	306,631	mBtu	

Table I-1 May 2016 Monthly Consumption for TAMU Buildings (*Continued*)

TAMU#	Building Name	Area (ft^2)	MeterID	Type	Monthly Consumption	Units	Comments
0449	Biological Sciences Building - West	96,038	003978	ELE	190,441	kWh	
0449	Biological Sciences Building - West	96,038	003981	CHW	1,371,145	mBtu	
0449	Biological Sciences Building - West	96,038	003985	HHW	207,677	mBtu	
0450	Duncan Dining Hall	128,482	000300	ELE	65,613	kWh	
0450	Duncan Dining Hall	128,482	002998	CHW	547,397	mBtu	
0450	Duncan Dining Hall	128,482	003009	HHW	78,312	mBtu	
0454	MSC (East Main)	392,000	007600	ELE	286,405	kWh	
0454	MSC (West Main)	392,000	007601	ELE	208,143	kWh	
0454	MSC BOR	392,000	008047	ELE	15,632	kWh	
0454	MSC	392,000	007584	CHW	2,763,872	mBtu	
0454	MSC BOR	392,000	004184	CHW	420,732	mBtu	
0454	MSC	392,000	007585	HHW	351,220	mBtu	
0454	MSC BOR	392,000	004196	HHW	226,447	mBtu	
0456	Military Sciences Building	43,808	006939	CHW	486,272	mBtu	
0456	Military Sciences Building	43,808	006943	HHW	199,077	mBtu	
0457	TAES Annex Building	16,364	005863	ELE	14,865	kWh	
0457	TAES Annex Building	16,364	005913	CHW	82,838	mBtu	
0457	TAES Annex Building	16,364	005917	HHW	38,848	mBtu	(2)
0461	Coke Building	24,466	004008	ELE	33,802	kWh	*
0461	Coke Building	24,466	005307	CHW	161,162	mBtu	
0461	Coke Building	24,466	004023	HHW	3,148	mBtu	
0462	Academic Building	82,555	005861	ELE	18,734	kWh	
0462	Academic Building	82,555	005903	ELE	34,672	kWh	
0462	Academic Building	82,555	005905	CHW	528,737	mBtu	
0462	Academic Building	82,555	005909	HHW	351,763	mBtu	
0463	Psychology Building	48,215	001575	ELE	38,413	kWh	
0463	Psychology Building	48,215	002941	CHW	411,156	mBtu	(2)
0463	Psychology Building	48,215	002945	HHW	45,111	mBtu	
0464	State Chemist Building	20,027	005839	ELE	8,681	kWh	
0464	State Chemist Building	20,027	005837	ELE	7,918	mBtu	
0464	State Chemist Building	20,027	005841	HHW	174	mBtu	
0465	Butler Hall	29,699	003997	ELE	32,524	kWh	
0465	Butler Hall	29,699	004000	CHW	324,932	mBtu	(2)
0465	Butler Hall	29,699	004004	HHW	130,551	mBtu	(2)
0467	Biological Sciences Building - East	62,273	001543	ELE	192,022	kWh	(2)
0467	Biological Sciences Building - East	62,273	003851	CHW	770,372	mBtu	
0467	Biological Sciences Building - East	62,273	003862	HHW	108,879	mBtu	
0468	Evans Library	712,093	000304	ELE	262,211	kWh	
0468	Evans Library	712,093	000318	ELE	130,457	kWh	
0468	Evans Library	712,093	000319	ELE	98,183	kWh	
0468	Evans Library	712,093	000320	ELE	88,601	kWh	
0468	Evans Library	712,093	006429	ELE	88,624	kWh	*
0468	Evans Library	712,093	003701	CHW	1,241,340	mBtu	(2)
0468	Evans Library	712,093	003895	CHW	1,598,515	mBtu	#, (1), (2)
0468	Evans Library	712,093	003903	CHW	284,437	mBtu	(2)
0468	Evans Library	712,093	003911	CHW	1,144,115	mBtu	*, (2)
0468	Evans Library	712,093	003712	HHW	106,223	mBtu	(2)
0468	Evans Library	712,093	003899	HHW	461,625	mBtu	#, (1), (2)
0468	Evans Library	712,093	003907	HHW	66,168	mBtu	(2)
0468	Evans Library	712,093	003922	HHW	100,414	mBtu	*, (2)
0468	Evans Library	712,093	005303	HHW	7,286	mBtu	(2)
0469	Central Campus Parking Garage	251,304	000306	ELE	46,197	kWh	
0469	Central Campus Parking Garage	2,844	003716	CHW	42,275	mBtu	
0469	Central Campus Parking Garage	2,844	003720	HHW	4,033	mBtu	
0470	Glasscock History Bldg	39,887	006407	ELE	17,164	kWh	
0470	Glasscock History Bldg	39,887	006638	CHW	169,936	mBtu	
0470	Glasscock History Bldg	39,887	006642	HHW	22,087	mBtu	
0471	Pavilion	40,062	001455	ELE	37,742	kWh	
0471	Pavilion	40,062	002769	CHW	225,041	mBtu	
0471	Pavilion	40,062	002780	HHW	5,051	mBtu	(2)
0472	Animal Industries	44,856	009042	ELE	48,970	kWh	
0472	Animal Industries	44,856	009109	CHW	459,607	mBtu	
0472	Animal Industries	44,856	009113	HHW	60,036	mBtu	
0473	Williams Administration Building	69,898	007945	ELE	58,117	kWh	
0473	Williams Administration Building	69,898	007946	CHW	635,306	mBtu	
0473	Williams Administration Building	69,898	007947	HHW	223,161	mBtu	
0474	YMCA Building	36,035	007524	ELE	23,520	kWh	
0474	YMCA Building	36,035	007525	CHW	152,124	mBtu	
0474	YMCA Building	36,035	007526	HHW	9,107	mBtu	
0476	Francis Hall	36,850	008015	ELE	35,402	kWh	
0476	Francis Hall	36,850	008033	CHW	363,440	mBtu	
0476	Francis Hall	36,850	008034	HHW	2,633	mBtu	

Table I-1 May 2016 Monthly Consumption for TAMU Buildings (*Continued*)

TAMU#	Building Name	Area (ft^2)	MeterID	Type	Monthly Consumption	Units	Comments
0477	Anthropology Building	51,592	001558	ELE	29,817	kWh	
0477	Anthropology Building	51,592	003664	CHW	413,734	mBtu	
0477	Anthropology Building	51,592	003668	HHW	46,434	mBtu	
0478	Scoates Hall	62,228	007961	ELE	52,613	kWh	(2)
0478	Scoates Hall	62,228	007968	CHW	390,019	mBtu	(2)
0478	Scoates Hall	62,228	007969	HHW	70,367	mBtu	(2)
0480	Bolton Hall	39,686	006845	ELE	32,935	kWh	
0480	Bolton Hall	39,686	007012	CHW	196,713	mBtu	
0480	Bolton Hall	39,686	007016	HHW	46,607	mBtu	
0481	Heaton Hall	13,640	005712	ELE	NA	kWh	*
0481	Heaton Hall	13,640	007531	CHW	261,739	mBtu	
0481	Heaton Hall	13,640	007535	HHW	181,988	mBtu	
0482	Fermier Hall	19,074	005779	ELE	24,874	kWh	
0482	Fermier Hall	19,074	005878	CHW	329,489	mBtu	
0482	Fermier Hall	19,074	005881	HHW	136,862	mBtu	
0483	Thompson Hall	81,404	003688	ELE	57,241	kWh	
0483	Thompson Hall	81,404	003887	CHW	241,763	mBtu	
0483	Thompson Hall	81,404	003891	HHW	18,972	mBtu	
0484	Chemistry Building	205,393	007152	ELE	94,975	kWh	
0484	Chemistry Building	205,393	007556	ELE	16,105	kWh	*
0484	Chemistry Building	205,393	007557	ELE	126,973	kWh	*
0484	Chemistry Building	205,393	007559	ELE	193,038	kWh	*
0484	Chemistry Building	205,393	007028	CHW	2,347,790	mBtu	
0484	Chemistry Building	205,393	007223	CHW	3,977,319	mBtu	
0484	Chemistry Building	205,393	007032	HHW	378,660	mBtu	
0484	Chemistry Building	205,393	007227	HHW	1,183,203	mBtu	
0490	Halbouty Geosciences Building	120,874	006691	ELE	63,585	kWh	
0490	Halbouty Geosciences Building	120,874	006695	ELE	108,794	kWh	
0490	Halbouty Geosciences Building	120,874	006896	CHW	1,394,628	mBtu	
0490	Halbouty Geosciences Building	120,874	006913	CHW	634,728	mBtu	
0490	Halbouty Geosciences Building	120,874	006900	HHW	323,815	mBtu	
0490	Halbouty Geosciences Building	120,874	006917	HHW	185,440	mBtu	
0492	Civil Engineering Building	56,537	005783	ELE	71,262	kWh	
0492	Civil Engineering Building	56,537	005950	CHW	378,420	mBtu	
0492	Civil Engineering Building	56,537	005954	HHW	148,907	mBtu	
0495	Sbisa Dining Hall	94,233	000352	ELE	125,949	kWh	
0495	Sbisa Dining Hall	94,233	000353	ELE	93,464	kWh	
0495	Sbisa Dining Hall	94,233	001951	CHW	1,399,205	mBtu	
0495	Sbisa Dining Hall	94,233	001957	HHW	264,294	mBtu	
0496	Utilities & Energy Services Central Office	46,110	007706	ELE	11,250	kWh	(2)
0496	Utilities & Energy Services Central Office	46,110	006929	CHW	166,877	mBtu	(2)
0496	Utilities & Energy Services Central Office	46,110	006933	HHW	35,452	mBtu	(2)
0499	Engineering Innovation Center	28,339	001561	ELE	24,860	kWh	
0499	Engineering Innovation Center	28,339	002672	CHW	84,469	mBtu	* (2)
0499	Engineering Innovation Center	28,339	002683	HHW	11,340	mBtu	* (2)
0501	Concrete Materials Laboratory	9,600	005791	ELE	7,972	kWh	
0506	Nagle Hall	32,306	001484	ELE	13,034	kWh	(2)
0506	Nagle Hall	32,306	003619	CHW	363,301	mBtu	
0506	Nagle Hall	32,306	003623	HHW	17,703	mBtu	
0507	Veterinary Medical Science Building	69,367	003013	ELE	83,181	kWh	
0507	Veterinary Medical Science Building	69,367	003640	CHW	1,321,324	mBtu	*
0507	Veterinary Medical Science Building	69,367	003644	HHW	384,386	mBtu	*
0508	Veterinary Teaching Hospital	96,416	003022	ELE	93,420	kWh	
0508-1026	Veterinary Teaching Hospital and Veterinary Medicine Administration	191,096	004166	CHW	2,080,128	mBtu	
0508-1026	Veterinary Teaching Hospital and Veterinary Medicine Administration	191,096	004170	HHW	495,597	mBtu	
0511	Heep Laboratory Building	40,476	005787	ELE	67,951	kWh	
0511	Heep Laboratory Building	40,476	005821	CHW	557,250	mBtu	
0511	Heep Laboratory Building	40,476	005825	HHW	204,797	mBtu	
0512	All Faiths Chapel	8,999	004340	ELE	7,505	kWh	
0512	All Faiths Chapel	8,999	004288	CHW	97,662	mBtu	
0512	All Faiths Chapel	8,999	004293	HHW	39,687	mBtu	
0513	Doherty Building	42,336	000299	ELE	62,405	kWh	
0513	Doherty Building	42,336	002898	CHW	801,851	mBtu	
0513	Doherty Building	42,336	002902	HHW	343,025	mBtu	
0514	Munnerlyn Astronomy & Space Sciences Engineering	22,134	007558	ELE	13,086	kWh	
0514	Munnerlyn Astronomy & Space Sciences Engineering	22,134	007487	CHW	85,031	mBtu	
0514	Munnerlyn Astronomy & Space Sciences Engineering	22,134	007491	HHW	2,966	mBtu	

Table I-1 May 2016 Monthly Consumption for TAMU Buildings (*Continued*)

TAMU#	Building Name	Area (ft^2)	MeterID	Type	Monthly Consumption	Units	Comments
0516	Computing Services Center	30,014	005259	ELE	535,450	kWh	
0516	Computing Services Center	30,014	003959	CHW	1,639,589	mBtu	
0516	Computing Services Center	30,014	003963	HHW	2	mBtu	
0520	Beutel Health Center	63,318	003785	ELE	61,938	kWh	
0520	Beutel Health Center	63,318	003933	CHW	573,251	mBtu	#, (1)
0520	Beutel Health Center	63,318	003944	HHW	184,817	mBtu	#, (1)
0521	Heldenfels Hall	104,949	001547	ELE	79,720	kWh	
0521	Heldenfels Hall	104,949	002962	CHW	890,125	mBtu	
0521	Heldenfels Hall	104,949	002973	HHW	159,953	mBtu	
0524	Blocker building	257,953	001545	ELE	209,362	kWh	*
0524	Blocker building	257,953	002914	CHW	1,303,598	mBtu	
0524	Blocker building	257,953	002918	HHW	14,918	mBtu	(2)
0548	Clements Residence Hall	62,156	000048	ELE	31,347	kWh	
0548	Clements Residence Hall	62,156	002729	CHW	806,710	mBtu	
0548	Clements Residence Hall	62,156	002740	HHW	310,763	mBtu	
0549	Haas Residence Hall	69,668	001398	ELE	40,788	kWh	*
0549	Haas Residence Hall	69,668	002983	CHW	953,221	mBtu	
0549	Haas Residence Hall	69,668	002994	HHW	643,734	mBtu	
0550	McFadden Residence Hall	62,156	000339	ELE	36,517	kWh	
0550	McFadden Residence Hall	62,156	002188	CHW	906,253	mBtu	
0550	McFadden Residence Hall	62,156	002192	HHW	487,333	mBtu	
0652	Neeley Residence Hall	69,668	000056	ELE	37,413	kWh	#, (1)
0652	Neeley Residence Hall	69,668	002147	CHW	569,647	mBtu	*
0652	Neeley Residence Hall	69,668	002151	HHW	248,249	mBtu	*
0653	Hobby Residence Hall	62,156	000057	ELE	40,516	kWh	
0653	Hobby Residence Hall	62,156	002401	CHW	812,326	mBtu	
0653	Hobby Residence Hall	62,156	002405	HHW	402,925	mBtu	
0682	Wisenbaker Engineering Research Center	177,704	005246	ELE	259,222	kWh	
0682	Wisenbaker Engineering Research Center	177,704	003879	CHW	1,493,530	mBtu	
0682	Wisenbaker Engineering Research Center	177,704	003883	HHW	164,280	mBtu	
0740	McNew Laboratory	20,904	005874	ELE	52,400	kWh	
0740	McNew Laboratory	20,904	005974	CHW	441,150	mBtu	#, (1)
0740	McNew Laboratory	20,904	005968	HHW	116,822	mBtu	#, (1)
0806	Soil Testing Labs	5,544	006875	ELE	21,029	kWh	
0815	Entomology Research Lab	17,618	005799	ELE	26,112	kWh	
0815	Entomology Research Lab	17,618	006043	CHW	116,783	mBtu	
0880	TVMC-Small Animal Building	3,260	005958	CHW	25,242	mBtu	
0880	TVMC-Small Animal Building	3,260	005962	HHW	5	mBtu	(2)
0972	Laboratory Animal Care Building	52,178	007063	ELE	140,981	kWh	*
0972	Laboratory Animal Care Building	52,178	007067	ELE	54,679	kWh	
0972	Laboratory Animal Care Building	52,178	007071	CHW	2,621,007	mBtu	
0972	Laboratory Animal Care Building	52,178	006991	HHW	309,891	mBtu	
1020	Vivarium III	12,234	005857	ELE	20,825	kWh	
1020	Vivarium III	12,234	005997	CHW	240,601	mBtu	#, (1)
1020	Vivarium III	12,234	006001	HHW	2,118	mBtu	
1026	Veterinary Medicine Administration	94,680	006072	ELE	155,357	kWh	
1026	Veterinary Medicine Administration	94,680	006049	CHW	1,239,210	mBtu	
1026	Veterinary Medicine Administration	98,680	006053	HHW	434,605	mBtu	*
1041	Texas Vet Med Diagnostic Lab	55,169	001466	ELE	99,246	kWh	
1041	Texas Vet Med Diagnostic Lab	55,169	001539	ELE	82,898	kWh	
1041	Texas Vet Med Diagnostic Lab	55,169	003817	CHW	908,310	mBtu	
1041	Texas Vet Med Diagnostic Lab	55,169	004137	CHW	1,513,426	mBtu	
1041	Texas Vet Med Diagnostic Lab	55,169	003821	HHW	118,172	mBtu	
1041	Texas Vet Med Diagnostic Lab	55,169	004130	HHW	200,418	mBtu	
1042	Forest Science Laboratory Building	9,632	006036	ELE	32,248	kWh	
1085	Veterinary Small Animal Hospital	103,440	004136	ELE	233,691	kWh	
1085	Veterinary Small Animal Hospital	103,440	003656	CHW	1,967,183	mBtu	
1085	Veterinary Small Animal Hospital	103,440	003660	HHW	264,976	mBtu	
1089	Utilities Energy Office Annex	2,937	006964	ELE	4,235	kWh	
1146	Biological Control Facility	13,492	005795	ELE	35,172	kWh	(2)
1146	Biological Control Facility	13,492	005887	CHW	167,282	mBtu	
1146	Biological Control Facility	13,492	005891	HHW	57,731	mBtu	
1156	Physical Plant Administration & Shops	101,704	007483	ELE	129,765	kWh	
1156	Physical Plant Administration & Shops	101,704	007679	CHW	325,692	mBtu	(2)
1156	Physical Plant Administration & Shops	101,704	007683	HHW	96,590	mBtu	

Table I-1 May 2016 Monthly Consumption for TAMU Buildings (*Continued*)

TAMU#	Building Name	Area (ft^2)	MeterID	Type	Monthly Consumption	Units	Comments
1184	Veterinary Anatomic Pathology	17,223	001445	ELE	56,078	kWh	
1184	Veterinary Anatomic Pathology	17,223	006995	CHW	473,629	mBtu	
1184	Veterinary Anatomic Pathology	17,223	006999	HHW	94,300	mBtu	# (1)
1194	Veterinary Large Animal Hospital	140,865	005256	ELE	104,669	kWh	
1194	Veterinary Large Animal Hospital	140,865	003016	ELE	72,799	kWh	
1194	Veterinary Large Animal Hospital	140,865	007455	ELE	42,794	kWh	
1194	Veterinary Large Animal Hospital	140,865	003648	CHW	2,197,684	mBtu	
1194	Veterinary Large Animal Hospital	140,865	007456	CHW	279,486	mBtu	
1194	Veterinary Large Animal Hospital	140,865	003652	HHW	608,450	mBtu	
1194	Veterinary Large Animal Hospital	140,865	007457	HHW	41,647	mBtu	
1197	Veterinary Research Building	114,666	006355	ELE	70,479	kWh	(2)
1197	Veterinary Research Building	114,666	006359	ELE	34,420	kWh	(2)
1197	Veterinary Research Building	114,666	006062	CHW	2,566,883	mBtu	
1197	Veterinary Research Building	114,666	006066	HHW	644,973	mBtu	
1416	Hullabaloo Residence Hall	253,452	007845	ELE	166,619	kWh	
1416	Hullabaloo Residence Hall	253,452	007846	CHW	1,118,328	mBtu	
1416	Hullabaloo Residence Hall	253,452	007847	HHW	132,190	mBtu	
1450	University Apartments - Laundry at the Gardens	1,428	006885	ELE	6,748	kWh	
1451	University Apartments - The Gardens J	33,535	006981	ELE	17,800	kWh	
1453	University Apartments - The Gardens L	33,535	006884	ELE	15,839	kWh	
1454	University Apartments - The Gardens F	33,535	006980	ELE	18,003	kWh	*
1455	University Apartments - The Gardens G	33,535	006882	ELE	17,286	kWh	*
1456	University Apartments - The Gardens H	33,535	007962	ELE	15,964	kWh	
1457	University Apartments - The Gardens M	33,535	007503	ELE	20,144	kWh	
1458	University Apartments - The Gardens N	33,535	007504	ELE	19,387	kWh	
1459	University Apartments - The Gardens P	33,535	007505	ELE	21,470	kWh	
1460	University Apartments - The Gardens Q	33,535	007506	ELE	18,163	kWh	
1497	Utilities & Energy Services Business Office	3,480	007082	ELE	3,676	kWh	*
1497	Utilities & Energy Services Business Office	3,480	006341	CHW	20,771	mBtu	
1497	Utilities & Energy Services Business Office	3,480	006345	HHW	34	mBtu	
1501	Kleberg Center	165,031	007449	ELE	274,061	kWh	
1501	Kleberg Center	165,031	002624	CHW	1,490,860	mBtu	
1501	Kleberg Center	165,031	002628	HHW	688,624	mBtu	(2)
1502	Heep Center	158,979	001556	ELE	252,334	kWh	
1502	Heep Center	158,979	002599	CHW	1,961,616	mBtu	
1502	Heep Center	158,979	002603	HHW	274,915	mBtu	(1)
1503	Cater-Mattil Hall	27,958	007977	ELE	84,105	kWh	
1503	Cater-Mattil Hall	27,958	008001	CHW	545,518	mBtu	
1504	Reynolds Medical Sciences Building	169,859	003975	ELE	256,112	kWh	
1504	Reynolds Medical Sciences Building	169,859	003989	CHW	1,855,988	mBtu	
1504	Reynolds Medical Sciences Building	169,859	003993	HHW	353,596	mBtu	(1)
1505	Rosenthal Meat Science & Technology Center	30,889	003627	ELE	141,425	kWh	
1505	Rosenthal Meat Science & Technology Center	30,889	002573	CHW	235,120	mBtu	
1505	Rosenthal Meat Science & Technology Center	30,889	002577	HHW	23,946	mBtu	
1506	Horticulture-Forest Science Building	118,648	001544	ELE	162,972	kWh	
1506	Horticulture-Forest Science Building	118,648	003967	CHW	797,241	mBtu	
1506	Horticulture-Forest Science Building	118,648	003971	HHW	115,332	mBtu	
1507	Biochemistry-Biophysics Building	166,079	001459	ELE	162,475	kWh	
1507	Biochemistry-Biophysics Building	166,079	001460	ELE	156,002	kWh	
1507	Biochemistry-Biophysics Building	166,079	003025	CHW	1,894,301	mBtu	
1507	Biochemistry-Biophysics Building	166,079	003029	HHW	656,510	mBtu	
1508	Price Hobgood Ag. Engineering Research Lab	27,666	005638	ELE	27,841	kWh	
1508	Price Hobgood Ag. Engineering Research Lab	27,666	006005	CHW	167,700	mBtu	(1)
1508	Price Hobgood Ag. Engineering Research Lab	27,666	006009	HHW	2,669	mBtu	(1)
1509	Medical Sciences Library	84,183	000350	ELE	112,029	kWh	
1509	Medical Sciences Library	84,183	003777	CHW	831,206	mBtu	
1509	Medical Sciences Library	84,183	003781	HHW	82,210	mBtu	
1510	Wehner Building	259,681	006849	ELE	195,887	kWh	
1510	Wehner Building	259,681	006685	ELE	262,295	kWh	
1510	Wehner Building	259,681	002687	CHW	1,599,209	mBtu	
1510	Wehner Building	259,681	002691	HHW	175,361	mBtu	
1511	West Campus Library Facility	68,125	004342	ELE	85,839	kWh	
1511	West Campus Library Facility	68,125	004313	CHW	786,461	mBtu	
1511	West Campus Library Facility	68,125	004318	HHW	162,281	mBtu	
1512	Southern Crop Improvement Greenhouse	48,154	005931	ELE	97,264	kWh	#, (1)
1513	Borlaug Center for Southern Crop Improvement	68,739	005802	ELE	341,185	kWh	
1513	Borlaug Center for Southern Crop Improvement	68,739	005936	CHW	1,478,568	mBtu	
1513	Borlaug Center for southern Crop Improvement	68,739	005895	HHW	176,637	mBtu	

Table I-1 May 2016 Monthly Consumption for TAMU Buildings (*Continued*)

TAMU#	Building Name	Area (ft^2)	MeterID	Type	Monthly Consumption	Units	Comments
1518	TX School of Rural Public Health A	69,079	005273	ELE	76,808	kWh	
1519	TX School of Rural Public Health B	24,761	005274	ELE	46,874	kWh	#, (1)
1520	TX School of Rural Public Health C	13,264	005275	ELE	107,673	kWh	#, (1)
1518-1519-1520	TX School of Rural Public Health A,B,C	107,104	005294	CHW	1,366,543	mBtu	
1518-1519-1520	TX School of Rural Public Health A,B,C	107,104	005298	HHW	214,971	mBtu	
1525	Nuclear Magnetic Resonance Facility	37,282	006718	ELE	89,783	kWh	
1525	Nuclear Magnetic Resonance Facility	37,282	006715	CHW	931,360	mBtu	
1525	Nuclear Magnetic Resonance Facility	37,282	006716	HHW	393,534	mBtu	
1530	Interdisciplinary Life Sciences Building	218,540	006286	ELE	404,960	kWh	
1530	Interdisciplinary Life Sciences Building	218,540	006288	ELE	228,709	kWh	
1530	Interdisciplinary Life Sciences Building	218,540	006290	CHW	4,681,158	mBtu	
1530	Interdisciplinary Life Sciences Building	218,540	006294	HHW	971,423	mBtu	
1535	Agriculture and Life Sciences Building	168,353	007205	ELE	120,749	kWh	
1535	Agriculture and Life Sciences Building	168,353	007206	CHW	701,997	mBtu	
1535	Agriculture and Life Sciences Building	168,353	007207	HHW	20,448	mBtu	
1536	AgriLife Services Building	80,907	007571	ELE	47,762	kWh	
1536	AgriLife Services Building	80,907	007572	CHW	246,988	mBtu	
1536	AgriLife Services Building	80,907	007573	HHW	16,184	mBtu	
1538	Agriculture Program Visitors Center	12,923	007209	ELE	14,834	kWh	
1538	Agriculture Program Visitors Center	12,923	007210	CHW	84,166	mBtu	
1538	Agriculture Program Visitors Center	12,923	007211	HHW	9,221	mBtu	
1540	Physical Education Activity Program Building	116,900	007881	ELE	66,250	kWh	
1540	Physical Education Activity Program Building	116,900	007878	CHW	518,427	mBtu	
1540	Physical Education Activity Program Building	116,900	007879	HHW	99,914	mBtu	
1550	Olsen Field at Bluebell Park	60,537	007560	ELE	143,083	kWh	
1554	Reed Arena	230,000	007582	ELE	136,891	kWh	
1554	Reed Arena	230,000	006243	ELE	829	kWh	#, (1)
1554	Reed Arena	230,000	006244	ELE	85,567	kWh	
1554-1558	Reed Arena and Cox-McFerrin Center	328,185	007576	CHW	2,146,465	mBtu	
1554-1558	Reed Arena and Cox-McFerrin Center	328,185	007578	HHW	551,654	mBtu	
1558	Cox-McFerrin Center for Aggie Basketball	98,185	007581	ELE	75,323	kWh	
1558	Cox-McFerrin Center for Aggie Basketball	98,185	007575	CHW	484,408	mBtu	
1558	Cox-McFerrin Center for Aggie Basketball	98,185	007577	HHW	161,904	mBtu	
1559	West Campus Parking Garage	1,541,457	001453	ELE	175,860	kWh	
1559	West Campus Parking Garage	13,000	004322	CHW	62,879	mBtu	(2)
1559	West Campus Parking Garage	13,000	004327	HHW	7,126	mBtu	
1560	Student Recreation Center	334,642	000363	ELE	178,689	kWh	
1560	Student Recreation Center	334,642	000366	ELE	462,318	kWh	
1560	Student Recreation Center	334,642	002933	CHW	4,314,297	mBtu	
1560	Student Recreation Center	334,642	002937	HHW	1,287,906	mBtu	
1589-1590	White Creek Apartment 1 and White Creek Apts Activity Center	176,454	009197	ELE	79,393	kWh	
1589-1590	White Creek Apartment 1 and White Creek Apts Activity Center	176,454	009198	CHW	505,487	mBtu	
1589-1590	White Creek Apartment 1 and White Creek Apts Activity Center	176,454	009199	HHW	52,944	mBtu	
1591	White Creek Apartment 2	179,467	008528	ELE	90,093	kWh	
1591	White Creek Apartment 2	179,467	008529	CHW	503,607	mBtu	
1591	White Creek Apartment 2	179,467	008533	HHW	83,454	mBtu	
1592	White Creek Apartment 3	179,467	008538	ELE	87,654	kWh	
1592	White Creek Apartment 3	179,467	008539	CHW	556,115	mBtu	
1592	White Creek Apartment 3	179,467	008543	HHW	62,346	mBtu	
1600	Gilchrist TTI Building	67,143	005286	ELE	51,778	kWh	*, #, (1)
1600	Gilchrist TTI Building	67,143	002649	CHW	307,693	mBtu	*
1600	Gilchrist TTI Building	67,143	002653	HHW	46,234	mBtu	*
1601	International Ocean Discovery Building	86,576	006351	ELE	125,340	kWh	(2)
1601	International Ocean Discovery Building	86,576	006382	CHW	249,445	mBtu	(2)
1601	International Ocean Discovery Building	86,576	008144	CHW	59,691	mBtu	(2)
1601	International Ocean Discovery Building	86,576	008145	HHW	13,787	mBtu	(2)
1604	Offshore Technology Research Center	40,014	006659	ELE	94,786	kWh	
1604	Offshore Technology Research Center	40,014	006660	ELE	5,229	kWh	(2)
1604	Offshore Technology Research Center	40,014	008142	CHW	567,446	mBtu	(2)
1604	Offshore Technology Research Center	40,014	008143	HHW	158,787	mBtu	(2)
1606	George Bush Presidential Library & Museum	121,678	000244	ELE	108,942	kWh	
1606	George Bush Presidential Library & Museum	121,678	002808	CHW	1,269,246	mBtu	
1606	George Bush Presidential Library & Museum	121,678	002812	HHW	320,960	mBtu	
1607	Allen Building	133,327	000243	ELE	88,129	kWh	
1607	Allen Building	133,327	002800	CHW	518,960	mBtu	
1607	Allen Building	133,327	002804	HHW	52,194	mBtu	

Table I-1 May 2016 Monthly Consumption for TAMU Buildings (*Continued*)

TAMU#	Building Name	Area (ft^2)	MeterID	Type	Monthly Consumption	Units	Comments
1608	Annenberg Presidential Conference Center	65,688	000245	ELE	79,999	kWh	
1608	Annenberg Presidential Conference Center	65,688	002761	CHW	870,359	mBtu	
1608	Annenberg Presidential Conference Center	65,688	002765	HHW	327,605	mBtu	
1609	TTI Headquarters	66,707	006495	ELE	59,492	kWh	*
1609	TTI Headquarters	66,707	006496	CHW	401,100	mBtu	
1609	TTI Headquarters	66,707	006497	HHW	50,891	mBtu	
1611	Engineering Research Building	35,000	008462	ELE	175,088	kWh	(2)
1611	Engineering Research Building	35,000	008463	CHW	1,819,977	mBtu	(2)
1611	Engineering Research Building	35,000	008467	HHW	490,276	mBtu	(2)
1800	General Services Complex	203,369	005441	ELE	190,225	kWh	
1800	General Services Complex	203,369	005468	CHW	943,215	mBtu	
1800	General Services Complex	203,369	005472	HHW	48,765	mBtu	
1810	Office of the State Chemist Building	31,735	009073	ELE	62,724	kWh	*
1810	Office of the State Chemist Building	31,735	005460	CHW	499,701	mBtu	
1810	Office of the State Chemist Building	31,735	005464	HHW	87,546	mBtu	
1811	Vet Med Research Bldg Addition	52,993	006705	ELE	215,397	kWh	*
1811	Vet Med Research Bldg Addition	52,993	006706	CHW	1,318,108	mBtu	
1811	Vet Med Research Bldg Addition	52,993	006707	HHW	368,044	mBtu	
1900	Texas Institute for Genomic Medicine	34,120	005548	ELE	88,382	kWh	
1900	Texas Institute for Genomic Medicine	34,120	005545	CHW	1,370,136	mBtu	
1900	Texas Institute for Genomic Medicine	34,120	005546	HHW	340,282	mBtu	
1904	Texas A&M Institute for Preclinical Studies A	113,559	006364	ELE	239,737	kWh	
1904	Texas A&M Institute for Preclinical Studies A	113,559	006365	CHW	2,607,684	mBtu	
1904	Texas A&M Institute for Preclinical Studies A	113,559	006366	HHW	672,781	mBtu	
1910	National Center for Therapeutics Manufacturing	149,924	007517	ELE	204,544	kWh	
1910	National Center for Therapeutics Manufacturing	149,924	007518	ELE	173,521	kWh	
1910	National Center for Therapeutics Manufacturing	149,924	007519	CHW	4,670,624	mBtu	
1910	National Center for Therapeutics Manufacturing	149,924	007520	HHW	1,373,377	mBtu	
1911	Multi-Species Research Building	21,000	009138	ELE	24,042	kWh	
1911	Multi-Species Research Building	21,000	009129	CHW	397,540	mBtu	
1911	Multi-Species Research Building	21,000	009133	HHW	117,729	mBtu	#, (1)
10226	NCTM Manufacturing Building	113,397	007648	CHW	4,107,015	mBtu	
10226	NCTM Manufacturing Building	113,397	007649	HHW	1,091,570	mBtu	
10226	NCTM Manufacturing Building	113,397	008133	HHW	84,824	mBtu	

1 mBtu = 1 000 Btu

NA: Not available
Monthly consumption in blue: Modified values
* : Missing data
# : Questionable data
(1): Consumption estimated and documented in the report *Part II - Data Analysis: Energy Use Estimation and Observations Section 2*
(2): Observation(s) documented in the report *Part II - Data Analysis: Energy Use Estimation and Observations Section 3*
(3): Missing data or changed consumption levels due to construction

II. Data Analysis: Energy Use Estimation and Observation

II-1 Meters with Missing Energy Consumption Data

During the month of May 2016, 62 meters in 32 buildings and complexes have missing daily data. The missing data have been filled in using consumption models based on the past data if available or using linear interpolation or some sort of average, and the monthly consumption has been estimated with the filled-in daily consumption. Table II-1 is the list of meters with missing data.

Table II-1 Meters with missing data during May 2016

Building No.	Building Name	MeterID	Type	Unit	Original Monthly Consumption	Estimated Monthly Consumption	# of Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
361	Bright Football Complex	008461	ELE	kWh	NA	224,206	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
394	Underwood Residence Hall	002117	CHW	mBtu	416,226	**	13																			A	A	A	A	A	A	A	A	A	A	A	A	A
394	Underwood Residence Hall	002121	HHW	mBtu	320,773	**	13																			A	A	A	A	A	A	A	A	A	A	A	A	A
400	Spence Hall Dorm 1	009169	ELE	kWh	NA	***	31																															
400	Spence Hall Dorm 1	009170	CHW	mBtu	315,551	361,954	6						LI	LI	LI	LI	LI																				LI
400	Spence Hall Dorm 1	009171	HHW	mBtu	123,581	148,640	6						LI	LI	LI	LI	LI																				LI
401	Kiest Hall Dorm 2	009150	ELE	kWh	NA	***	31																															
401	Kiest Hall Dorm 2	009151	CHW	mBtu	665,648	726,293	5					LI	LI	LI	LI																						LI
401	Kiest Hall Dorm 2	009152	HHW	mBtu	428,450	466,410	5					LI	LI	LI	LI																						LI
402	Briggs Hall Dorm 3	009205	ELE	kWh	NA	***	31																															
402	Briggs Hall Dorm 3	009206	CHW	mBtu	300,205	306,931	1																															LI
402	Briggs Hall Dorm 3	009207	HHW	mBtu	117,468	119,609	1																															LI
403	Fountain Hall Dorm 4	009222	ELE	kWh	NA	***	31																															
403	Fountain Hall Dorm 4	009223	CHW	mBtu	565,299	573,491	1																															LI
403	Fountain Hall Dorm 5	009224	HHW	mBtu	448,111	454,347	1																															LI
404	Gainer Hall Dorm 5	009227	ELE	kWh	NA	***	31																															
404	Gainer Hall Dorm 5	009228	CHW	mBtu	10,109	10,469	6	LI	LI	LI	LI	LI																										LI
404	Gainer Hall Dorm 5	009229	HHW	mBtu	8,337	8,846	6	LI	LI	LI	LI	LI																										LI
408	Whitely Hall - Dorm 9	000024	ELE	kWh	21,833	26,156	6																								M	M	M	M	M	M	M
408	Whitely Hall - Dorm 9	002079	CHW	mBtu	251,129	**	6																								M	M	M	M	M	M	M
408	Whitely Hall - Dorm 9	002083	HHW	mBtu	115,415	**	6																								M	M	M	M	M	M	M
409	White Hall - Dorm 10	000025	ELE	kWh	18,442	22,663	6																								M	M	M	M	M	M	M
409	White Hall - Dorm 10	002094	CHW	mBtu	276,456	343,549	6																								M	M	M	M	M	M	M
409	White Hall - Dorm 10	002098	HHW	mBtu	116,188	138,574	6																								M	M	M	M	M	M	M
410	Harrington Hall - Dorm 11	000327	ELE	kWh	15,492	20,138	8																							M	M	M	M	M	M	M	M
410	Harrington Hall - Dorm 11	002349	CHW	mBtu	200,232	**	8																							M	M	M	M	M	M	M	M
410	Harrington Hall - Dorm 11	002353	HHW	mBtu	69,416	**	8																							M	M	M	M	M	M	M	M
411	Utay Hall - Dorm 12	000026	ELE	kWh	27,547	28,127	1																															LI
411	Utay Hall - Dorm 12	002102	CHW	mBtu	250,886	257,455	1																															LI
411	Utay Hall - Dorm 12	002106	HHW	mBtu	94,791	96,482	1																															LI
419	Legett Residence Hall	000031	ELE	kWh	12,157	17,144	14																		LI	LI	LI	LI	LI	LI	LI	LI	LI	LI	LI	LI	LI	LI
419	Legett Residence Hall	002218	CHW	mBtu	117,207	225,033	14																		M	M	M	M	M	M	M	M	M	M	M	M	M	M
419	Legett Residence Hall	002222	HHW	mBtu	44,027	80,535	14																		M	M	M	M	M	M	M	M	M	M	M	M	M	M
444	Peterson Building	002922	CHW	mBtu	961,710	1,177,741	6					M	M	M	M	M	M																				
444	Peterson Building	006435	HHW	mBtu	207,083	269,006	6					M	M	M	M	M	M																				
461	Coke Building	004008	ELE	kWh	33,802	*	1																															
468	Evans Library	006429	ELE	kWh	88,624	*	3					M	M		M																							
468	Evans Library	003911	CHW	mBtu	NA	1,144,115	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
468	Evans Library	003922	HHW	mBtu	NA	100,414	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
481	Heaton Hall	005712	ELE	kWh	NA	***	31																															
484	Chemistry Building	007556	ELE	kWh	NA	16,105	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
484	Chemistry Building	007557	ELE	kWh	NA	126,973	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
484	Chemistry Building	007559	ELE	kWh	NA	193,038	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
499	Engineering Innovation Center	002672	CHW	mBtu	NA	84,469	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
499	Engineering Innovation Center	002683	HHW	mBtu	NA	11,340	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
507	Veterinary Medical Science Building	003640	CHW	mBtu	1,020,112	1,321,324	7																								M	M	M	M	M	M	M
507	Veterinary Medical Science Building	003644	HHW	mBtu	304,443	384,386	7																								M	M	M	M	M	M	M
524	Blocker building	001545	ELE	kWh	209,362	*	3																															
549	Haas Residence Hall	001398	ELE	kWh	41,728	40,788	9	A	A					A				A	A									A				A	A			A	
652	Neeley Residence Hall	002147	CHW	mBtu	319,781	569,647	13																			M	M	M	M	M	M	M	M	M	M	M	M	M
652	Neeley Residence Hall	002151	HHW	mBtu	141,757	248,249	13																			M	M	M	M	M	M	M	M	M	M	M	M	M
972	Laboratory Animal Care Building	007063	ELE	kWh	140,981	*	1																													M		
1026	Veterinary Medicine Administration	006053	HHW	mBtu	NA	434,605	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
1454	University Apartments - The Gardens F	006980	ELE	kWh	NA	18,003	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
1455	University Apartments - The Gardens G	006882	ELE	kWh	NA	17,286	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
1497	Utilities & Energy Services Business Office	007082	ELE	kWh	3,676	*	2																															
1600	Gilchrist TTI Building	005286	ELE	kWh	8,504	**	18	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M													
1600	Gilchrist TTI Building	002649	CHW	mBtu	115,588	307,693	18	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M													
1600	Gilchrist TTI Building	002653	HHW	mBtu	17,303	46,234	18	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M													
1609	TTI Headquarters	006495	ELE	kWh	59,492	*	1								M																							
1810	Office of the State Chemist Building	009073	ELE	kWh	NA	62,724	31	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
1811	Vet Med Research Bldg Addition	006705	ELE	kWh	215,397	*	2			M	M																											

* Monthly consumption evaluated from the cumulative data is not affected by the missing data.
** See Table II-2 for the estimated consumption.
*** Consumption is not estiamted because reliable consumtpion model is not available.
NA: Not available

II-2 Meters with Estimated Consumption for Problematic Data

During the month of May 2016, 33 meters in 23 buildings have estimated daily consumption because the recorded consumption is found to be problematic or questionable. For each of these meters, alternative consumption has been estimated using the best possible method. Table II-2 lists these meters with indications of the days with estimated data. Detailed descriptions for individual cases follow.

Table II-2 Meters with problematic data during May 2016

Building No.	Building Name /MeterID(s)	Type	Unit	Original Monthly Consumption	Estimated Monthly Consumption	# of days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
292	**Eppright Residence Hall**																																				
	002262	CHW	mBtu	1,419,323	703,481	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	002266	HHW	mBtu	1,114,113	254,923	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
384	**Sanders Corps of Cadets Center**																																				
	002583	CHW	mBtu	134,284	210,789	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	002587	HHW	mBtu	732	89,361	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
394	**Underwood Residence Hall**																																				
	002117	CHW	mBtu	**	836,570	4	A															A	A	A													
	002121	HHW	mBtu	**	647,160	4	A															A	A	A													
405	**Lacy Hall - Dorm 6**																																				
	007918	CHW	mBtu	687,223	341,087	13	M	M	M	M	M	M	M	M	M	M	M	M	M																		
408	**Whitely Hall - Dorm 9**																																				
	002079	CHW	mBtu	**	393,621	6																			M	M	M	M	M	M							
	002083	HHW	mBtu	**	156,103	6																			M	M	M	M	M	M							
410	**Harrington Hall - Dorm 11**																																				
	002349	CHW	mBtu	**	339,271	4																			M	M	M	M									
	002353	HHW	mBtu	**	115,623	4																			M	M	M	M									
441	**Krueger Residence Hall**																																				
	002504	CHW	mBtu	503,009	1,022,557	16																M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	002500	HHW	mBtu	195,455	382,158	16																M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
444	**Peterson Building**																																				
	004714	ELE	kWh	123,570	143,383	6					A	A	A	A	A	A																					
468	**Evans Library**																																				
	003895	CHW	mBtu	4,122,998	1,598,515	14																		A	A	A	A	A	A	A	A	A	A	A	A	A	A
	003899	HHW	mBtu	225,313	461,625	17											A	A	A					A	A	A	A	A	A	A	A	A	A	A	A	A	A
520	**Beutel Health Center**																																				
	003933	CHW	mBtu	371,476	573,251	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	003944	HHW	mBtu	53,596	184,817	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
652	**Neeley Residence Hall**																																				
	000056	ELE	kWh	35,157	37,413	13																			M	M	M	M	M	M	M	M	M	M	M	M	M
740	**McNew Laboratory**																																				
	005974	CHW	mBtu	388,379	441,150	8									M	M											M			M	M			M	M		M
	005968	HHW	mBtu	9,181	116,822	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
1020	**Vivarium III**																																				
	005997	CHW	mBtu	283,051	240,601	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
1184	**Veterinary Anatomic Pathology**																																				
	006999	HHW	mBtu	106,372	94,300	6														M							M							M	M	M	M
1502	**Heep Center**																																				
	002603	HHW	mBtu	244,682	274,915	6												M	M	M	M	M	M														
1504	**Reynolds Medical Sciences Building**																																				
	003993	HHW	mBtu	331,412	353,596	3																									M	M	M				
1508	**Price Hobgood Ag. Engineering Research Lab**																																				
	006005	CHW	mBtu	160,668	167,700	4	M	M	M	M																											
	006009	HHW	mBtu	6,441	2,669	2			M	M																											
1512	**Southern Crop Improvement Greenhouse**																																				
	005931	ELE	kWh	195,046	97,264	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		M	M
1519	**TX School of Rural Public Health B**																																				
	005274	ELE	kWh	107,673	46,874	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		M	M
1520	**TX School of Rural Public Health C**																																				
	005275	ELE	kWh	46,874	107,673	31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		M	M
1554	**Reed Arena**																																				
	006243	ELE	kWh	341	829	21				M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M							
1600	**Gilchrist TTI Building**																																				
	005286	ELE	kWh	**	51,778	8																			M	M	M	M	M	M	M	M					
1911	**Multi-Species Research Building**																																				
	009133	HHW	mBtu	88,381	117,729	19												M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		M	M

NA: Not available
** See Table II-1 for the original consumption.

Notes: The colored cells means the consumption for the day appears to be problematic. The letter in the colored cell indicates the method for estimation. M: model, F: multiplication factor, L: linear interpolation, A: average, and C: correction of the reset cumulative reading

Eppright Residence Hall (TAMU Bldg #292)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
CHW	002262	31	5/1/2016 – 5/31/2016	Model
HHW	002266	31	5/1/2016 – 5/31/2016	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption level has decreased suddenly.	4/30/2016 – ongoing
HHW	The consumption level has decreased suddenly.	4/30/2016 – ongoing

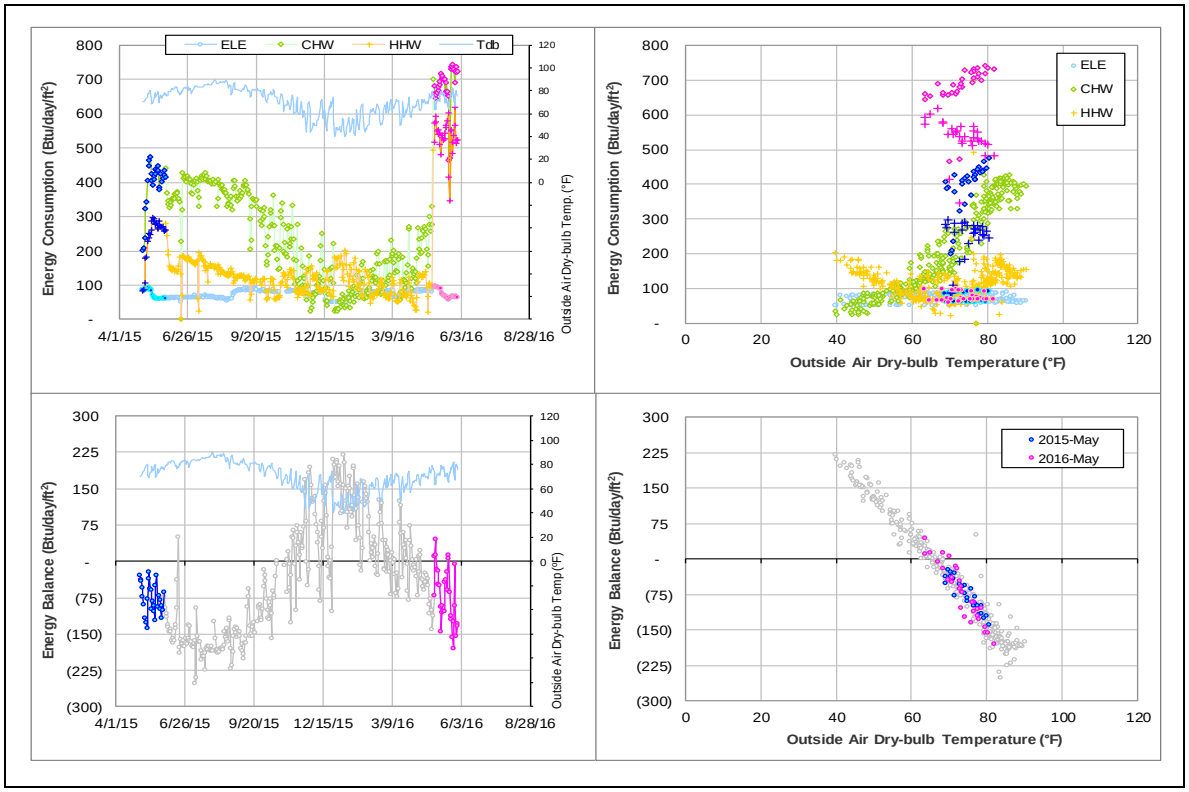
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
CHW	002262	4/30/2016 – ongoing	Flow Rate	Increased
HHW	002266	4/30/2016 – ongoing	Flow Rate	Increased

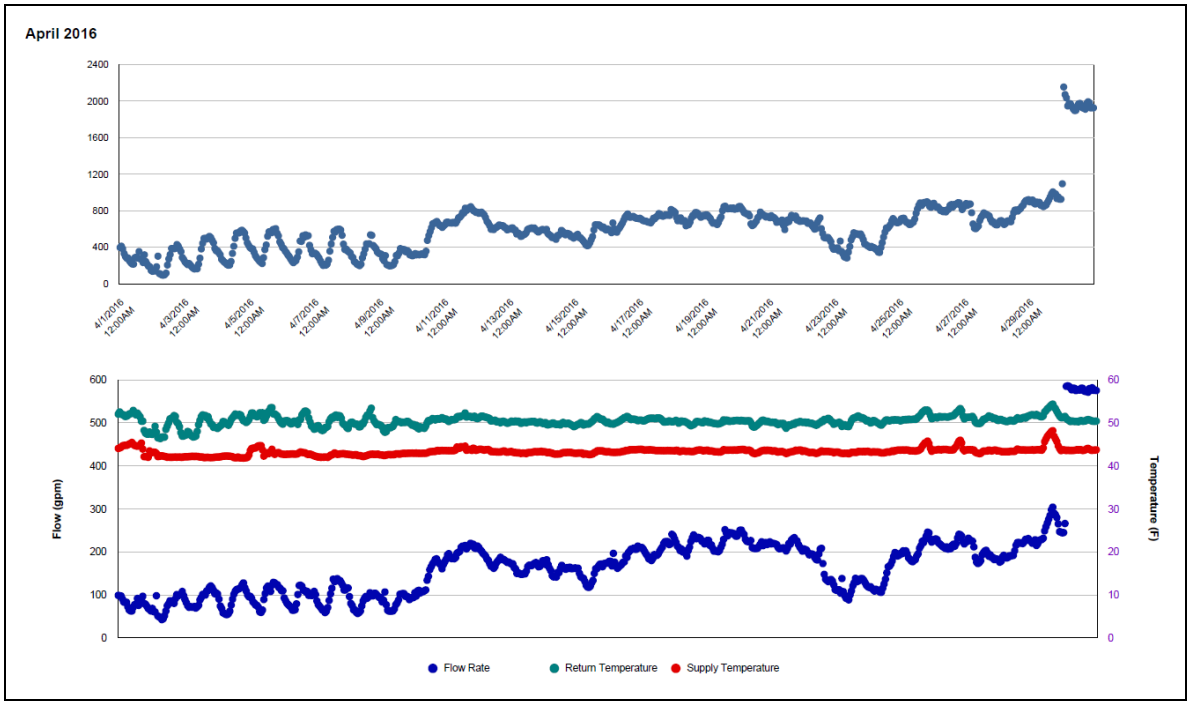
Quantitative descriptions and comments

Both the CHW and HHW consumption suddenly increased about 450 Btu/day/ft^2 since 4/30/2016, as the CHW and HHW flow rates increased 300 gpm and 60 gpm, respectively. After increased, the CHW/HHW consumption level was much higher than the other residence halls. However, the energy balance pattern didn't change. The consumption was estimated by models.

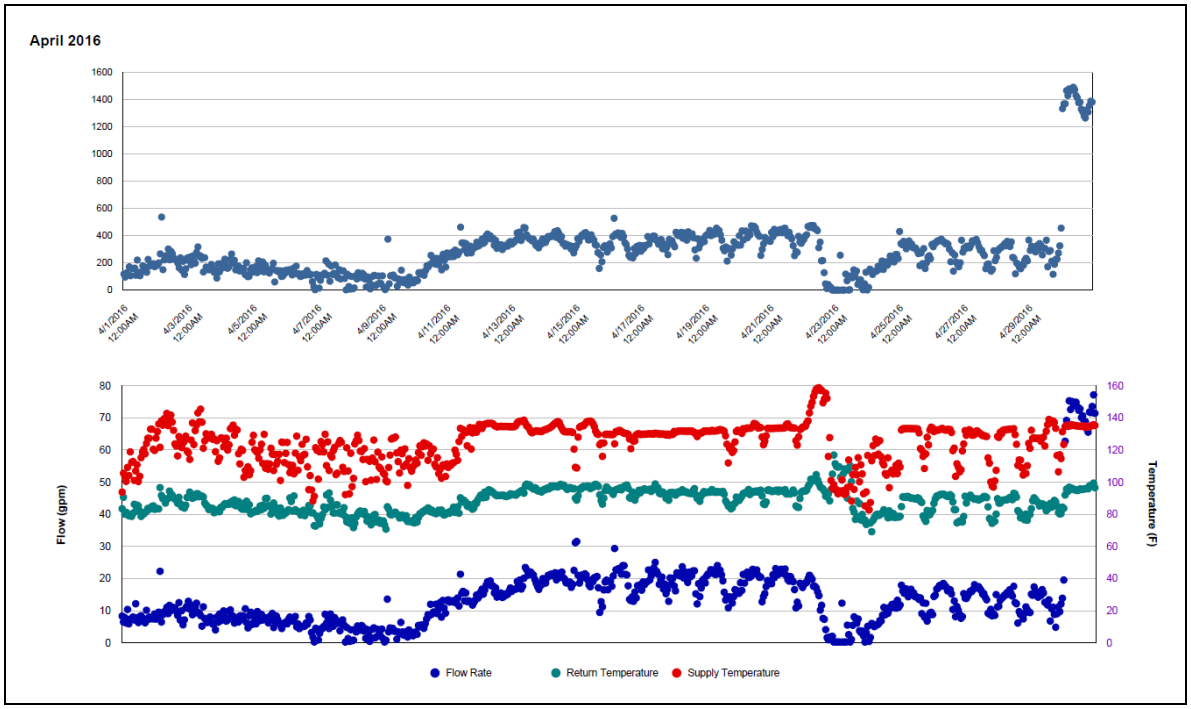
Explanatory Figure: 13 months energy balance plot with original data



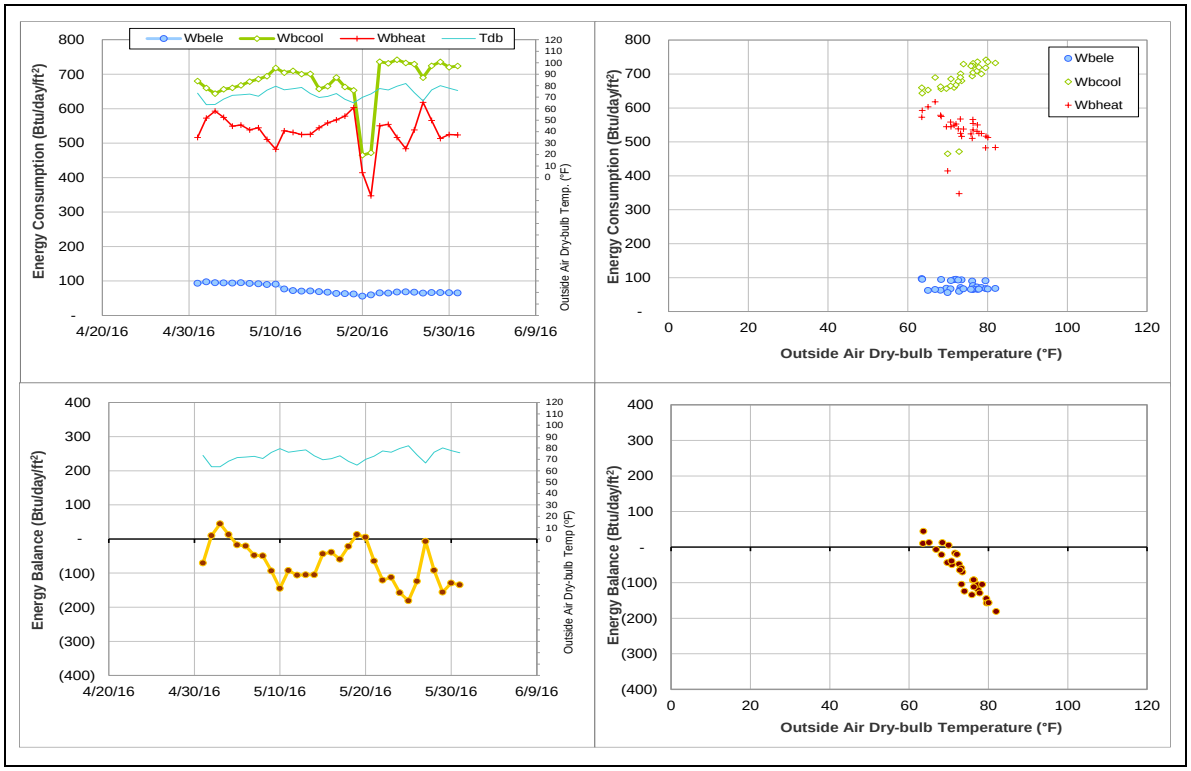
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (CHW during April 2016)



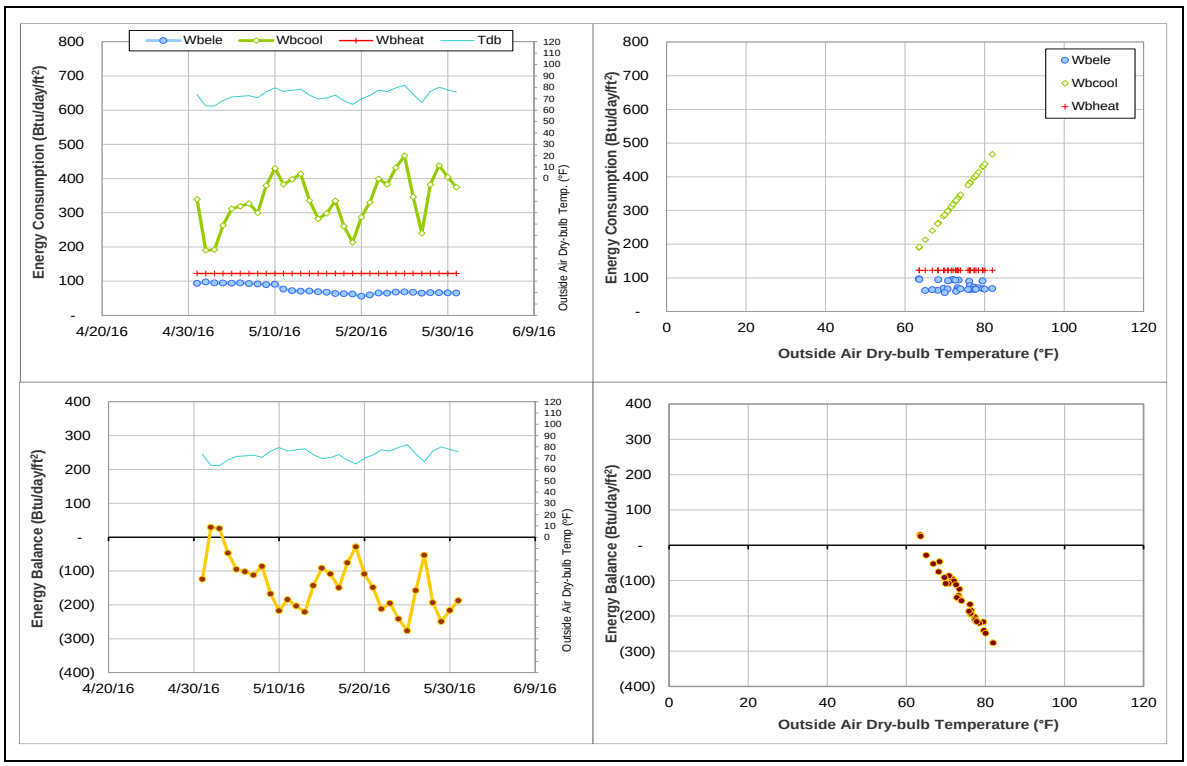
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (HHW during April 2016)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis.



Sanders Corps of Cadets Center (TAMU BLDG # 384)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
CHW	002583	31	5/1/2016 – 5/31/2016	Model
HHW	002587	31	5/1/2016 – 5/31/2016	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption level has decreased suddenly.	4/30/2016 – ongoing
HHW	The consumption level has decreased suddenly.	4/30/2016 – ongoing

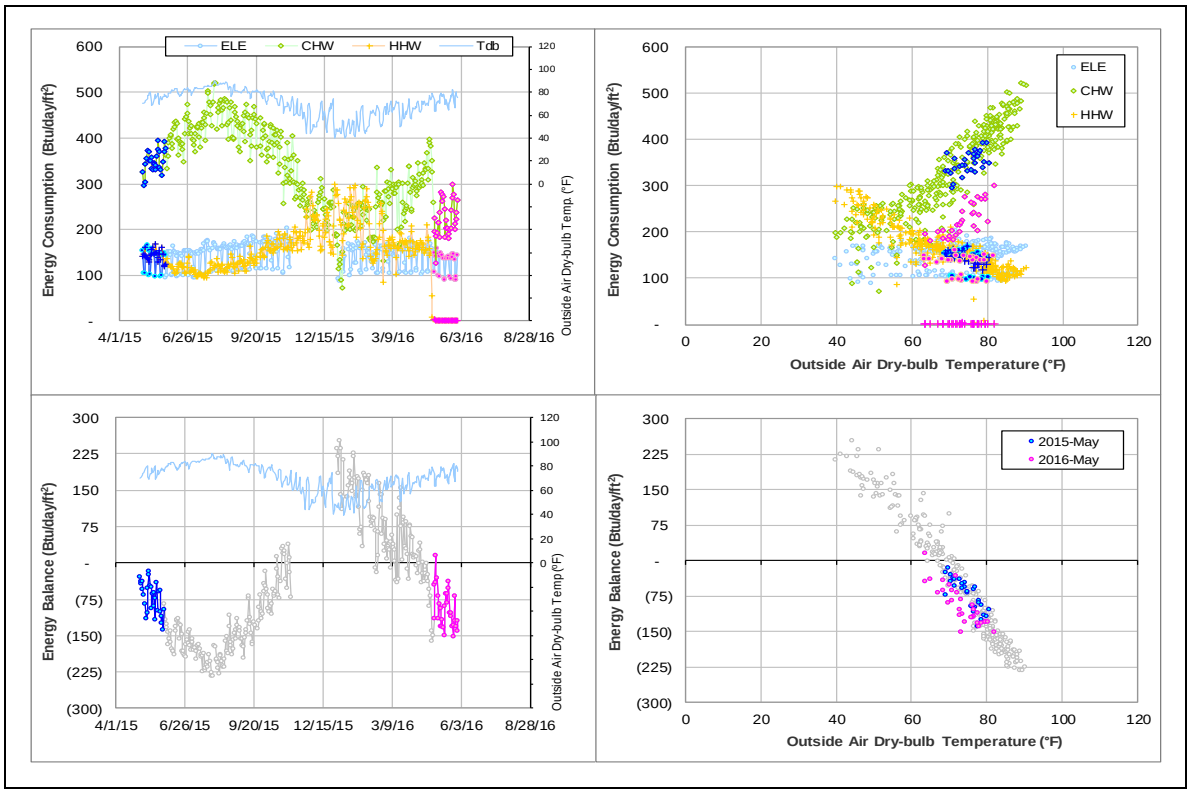
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
CHW	002583	4/30/2016 – ongoing	Flow Rate	Decreased
HHW	002587	4/30/2016 – ongoing	Flow Rate and Delta T	Decreased to nearly zero

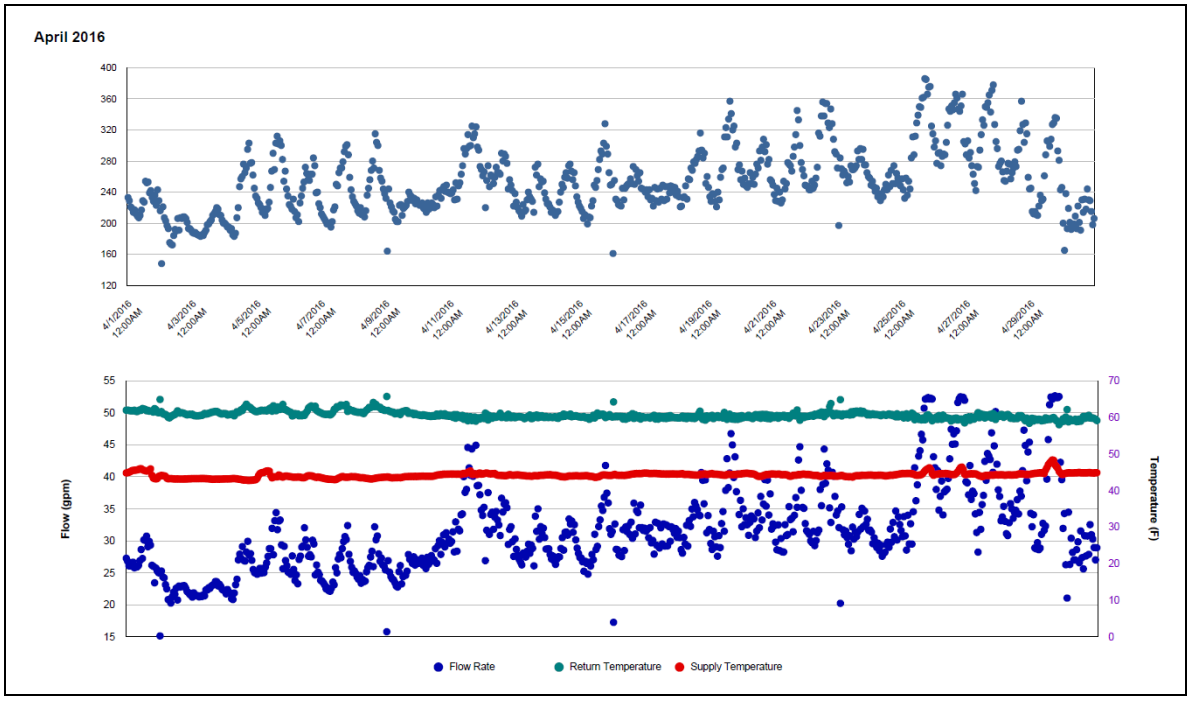
Quantitative descriptions and comments

The CHW consumption suddenly decreased about 100 Btu/day/ft^2 since 4/30/2016, due to the decrease of the flow rate. Around the same time, the HHW consumption decreased to nearly zero, as the flow rate and delta T both decreased to nearly zero. The energy balance was a little lower, but it was still at a reasonable range, with the cross point temperature of 65°F. The consumption was estimated by models.

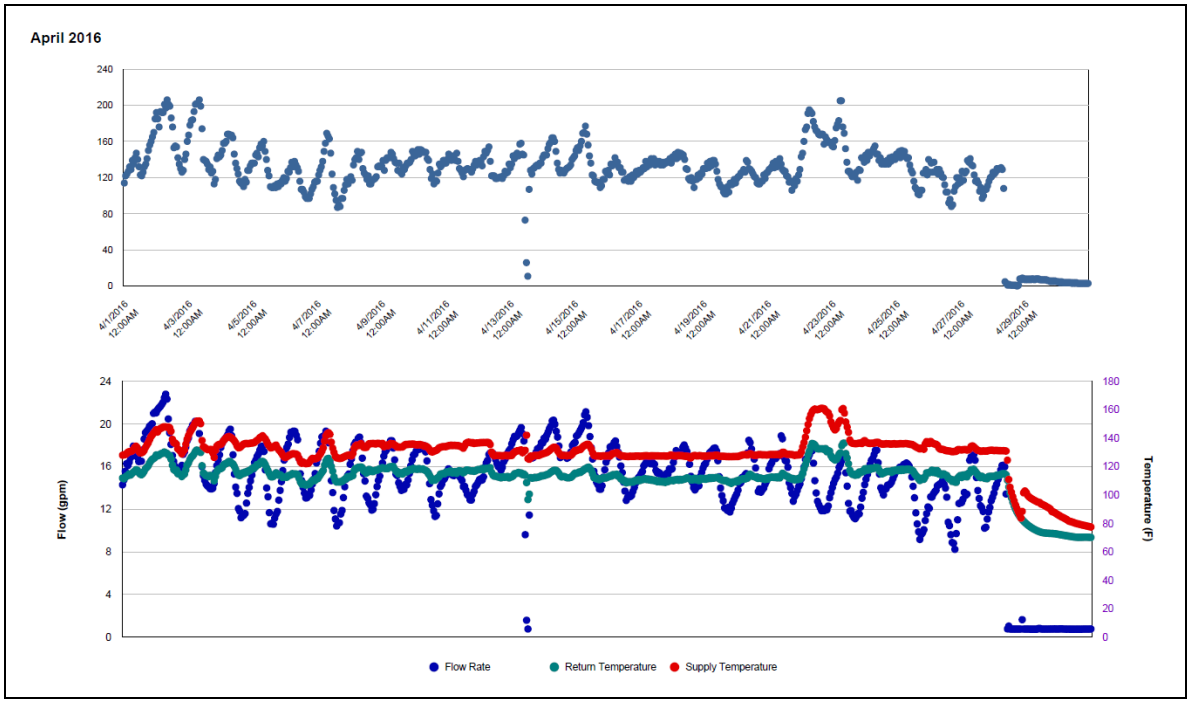
Explanatory Figure: 13 months energy balance plot with original data



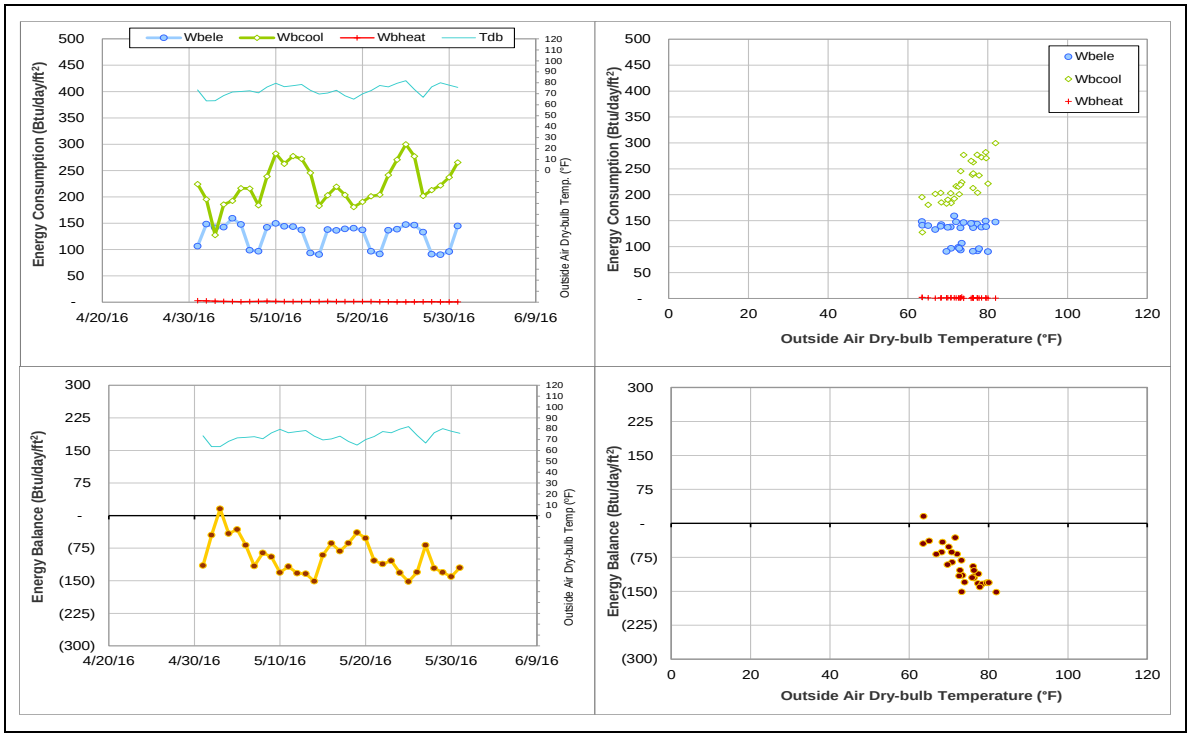
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (CHW during April 2016)



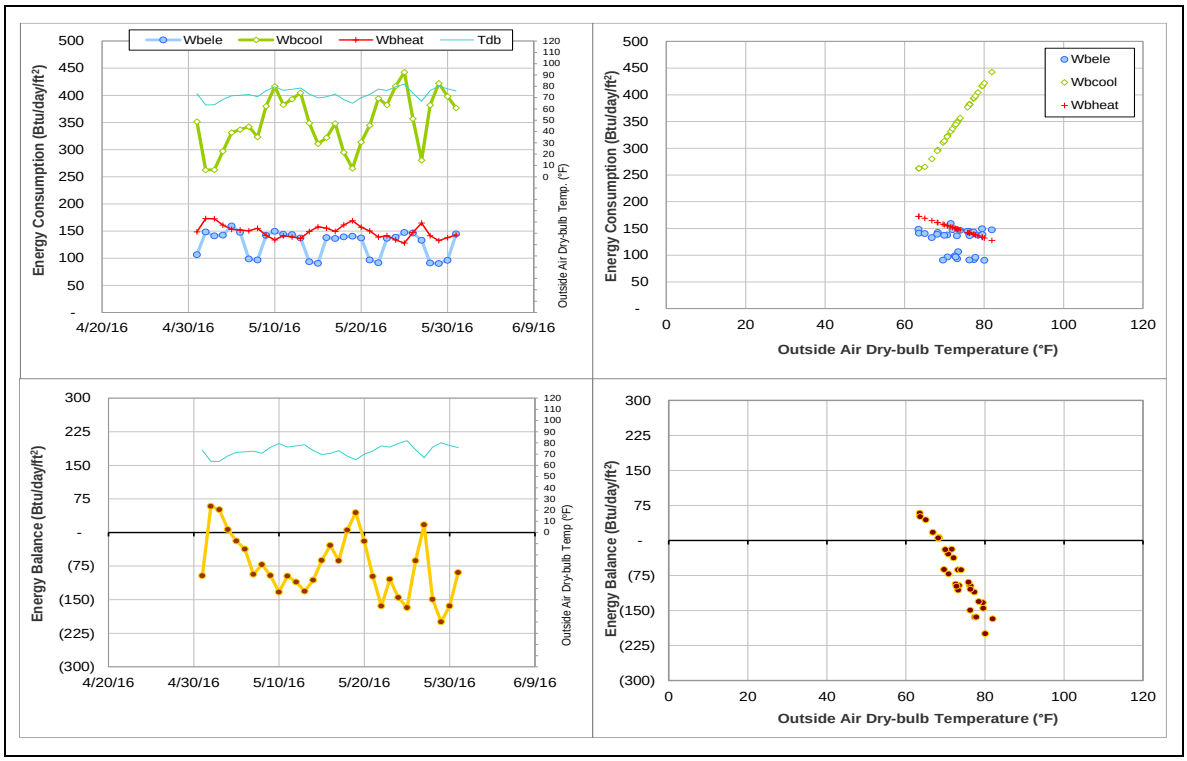
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (HHW during April 2016)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis.



Underwood Residence Hall (TAMU Bldg# 394)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
CHW	002117	4	5/1/2016, 5/16/2016 – 5/18/2016	Average
HHW	002121	4	5/1/2016, 5/16/2016 – 5/18/2016	Average

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption dropped for a short period.	5/1/2016, 5/16/2016 – 5/18/2016
HHW	The consumption dropped for a short period.	5/1/2016, 5/16/2016 – 5/18/2016

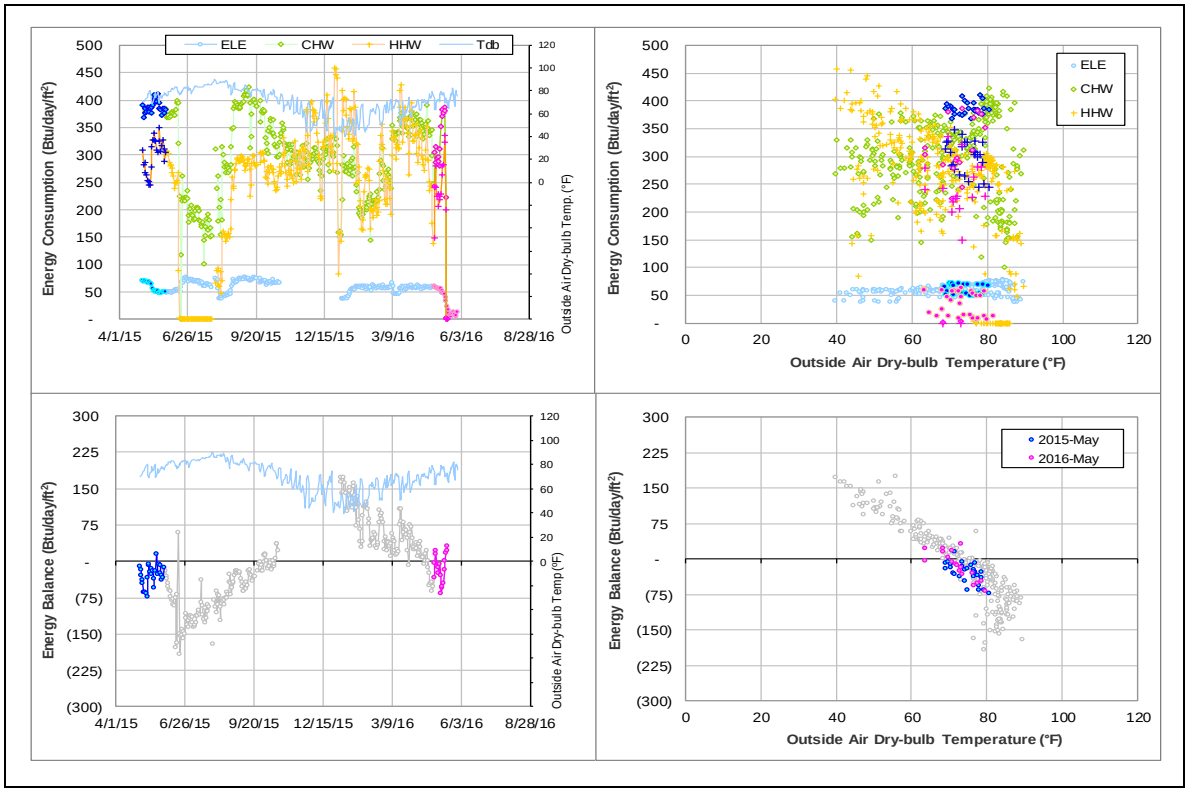
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
CHW	002117	5/16/2016 – 5/18/2016	Flow Rate	Zero, Faulty
HHW	002121	5/16/2016 – 5/18/2016	Flow Rate	Zero, Faulty

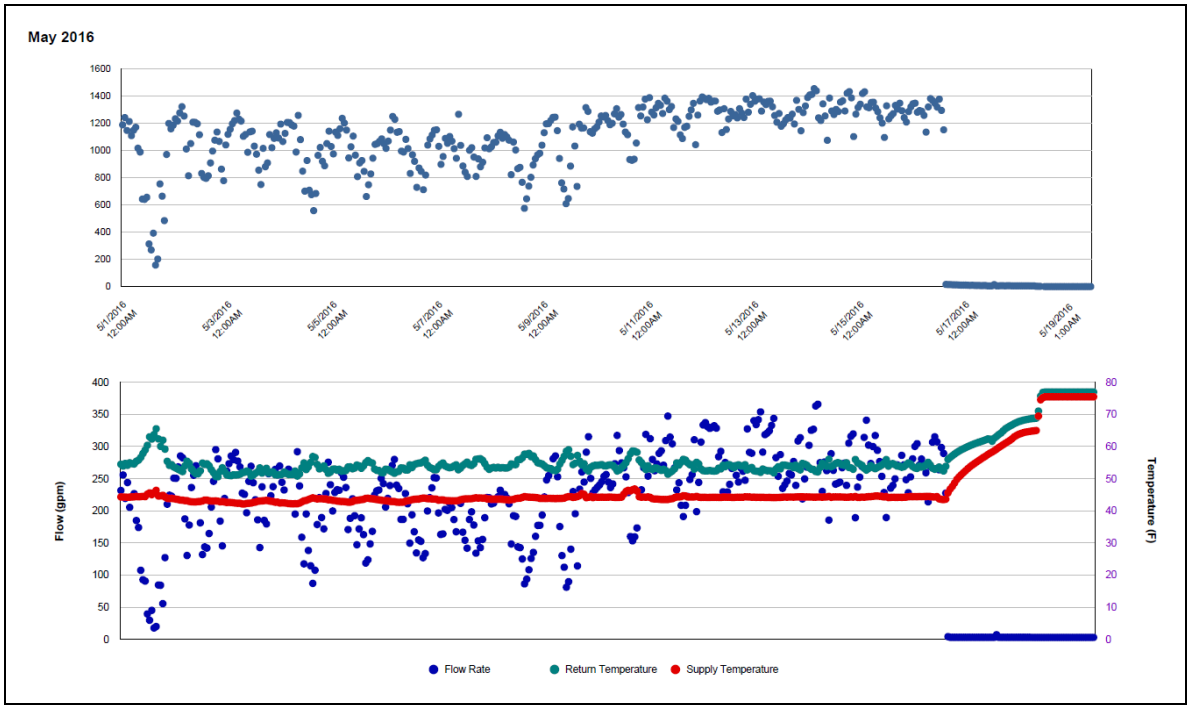
Quantitative descriptions and comments

The CHW and HHW consumption suddenly decreased to nearly zero during 5/16/2016-5/18/2016, as the CHW/HHW flow rate decreased to zero. The CHW and HHW consumption on 5/1/2016 was also a little lower than the other days. The consumption was estimated by the average of the rest days during this month.

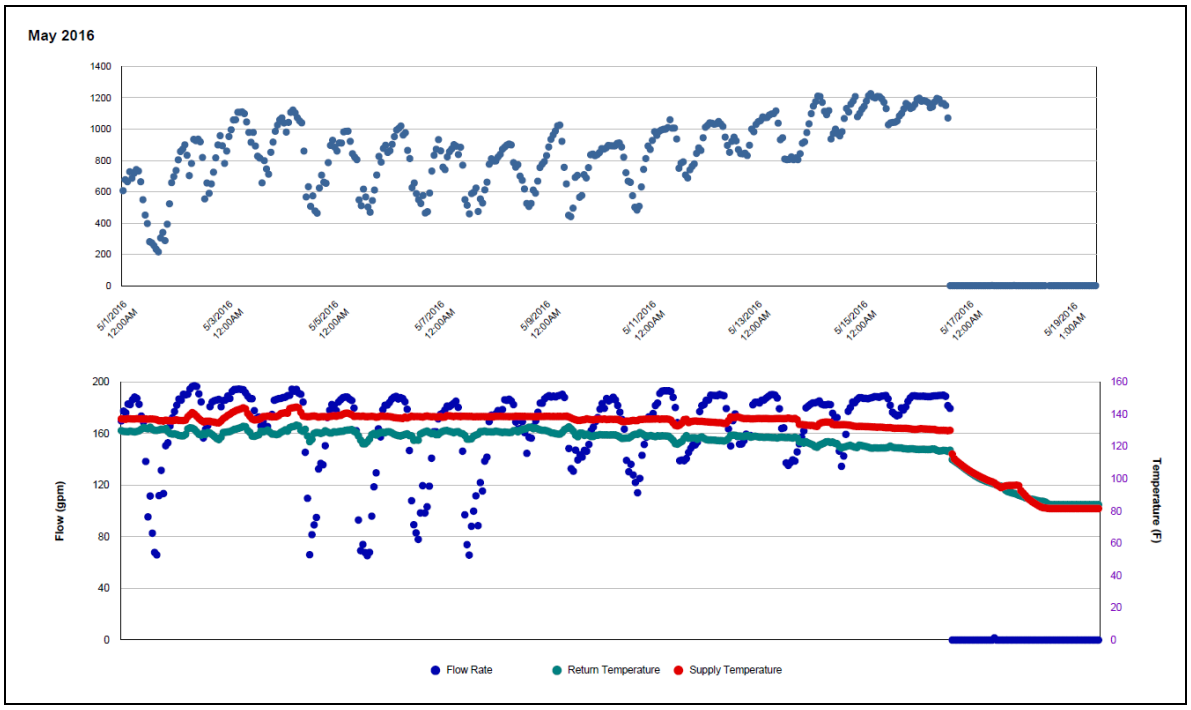
Explanatory Figure: 13 months energy balance plot with original data



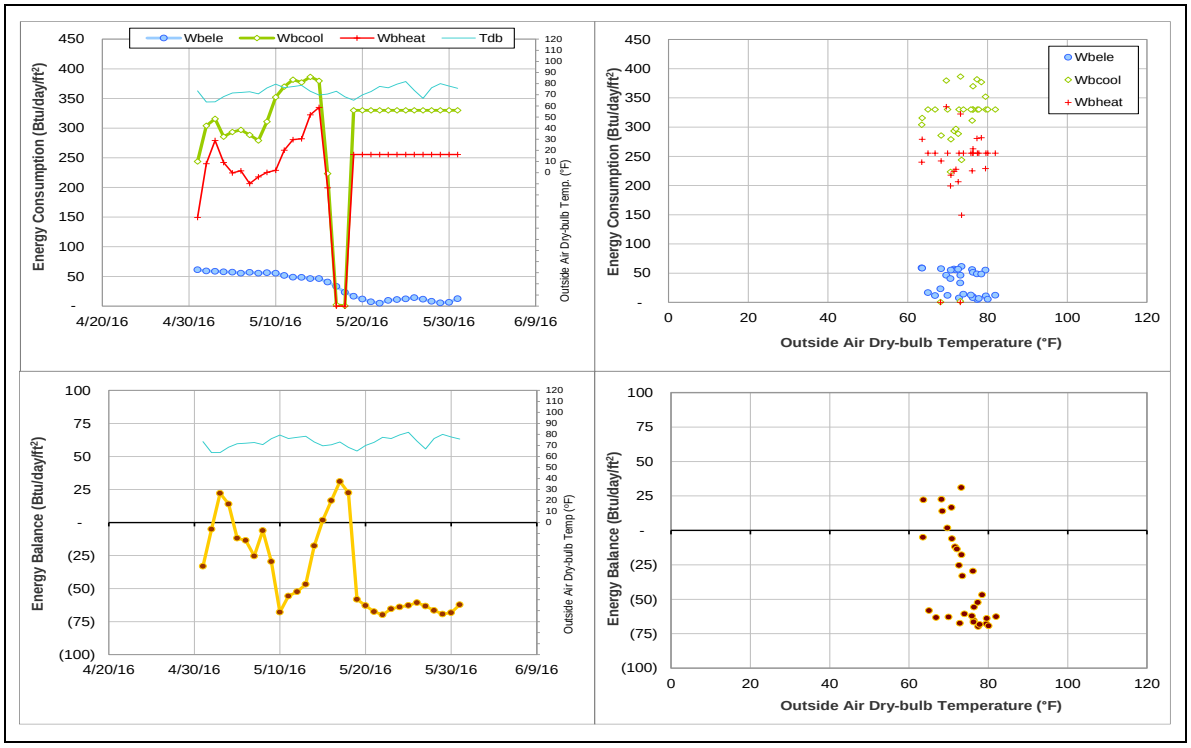
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (CHW meter during May 2016)



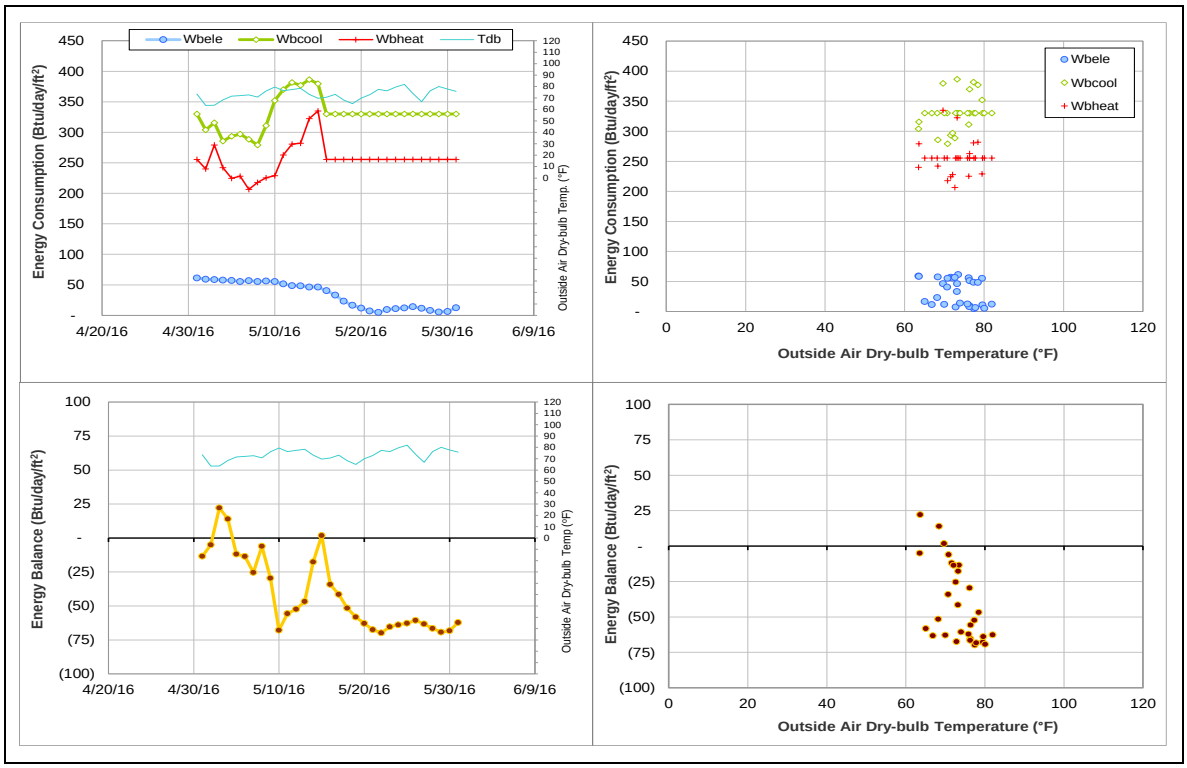
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (HHW meter during May 2016)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis.



Lacy Hall - Dorm 6 (TAMU Bldg# 405)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
CHW	007918	13	5/1/2016 – 5/13/2016	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption level has increased suddenly. The metered value appeared to be faulty.	4/10/2016 – 5/13/2016

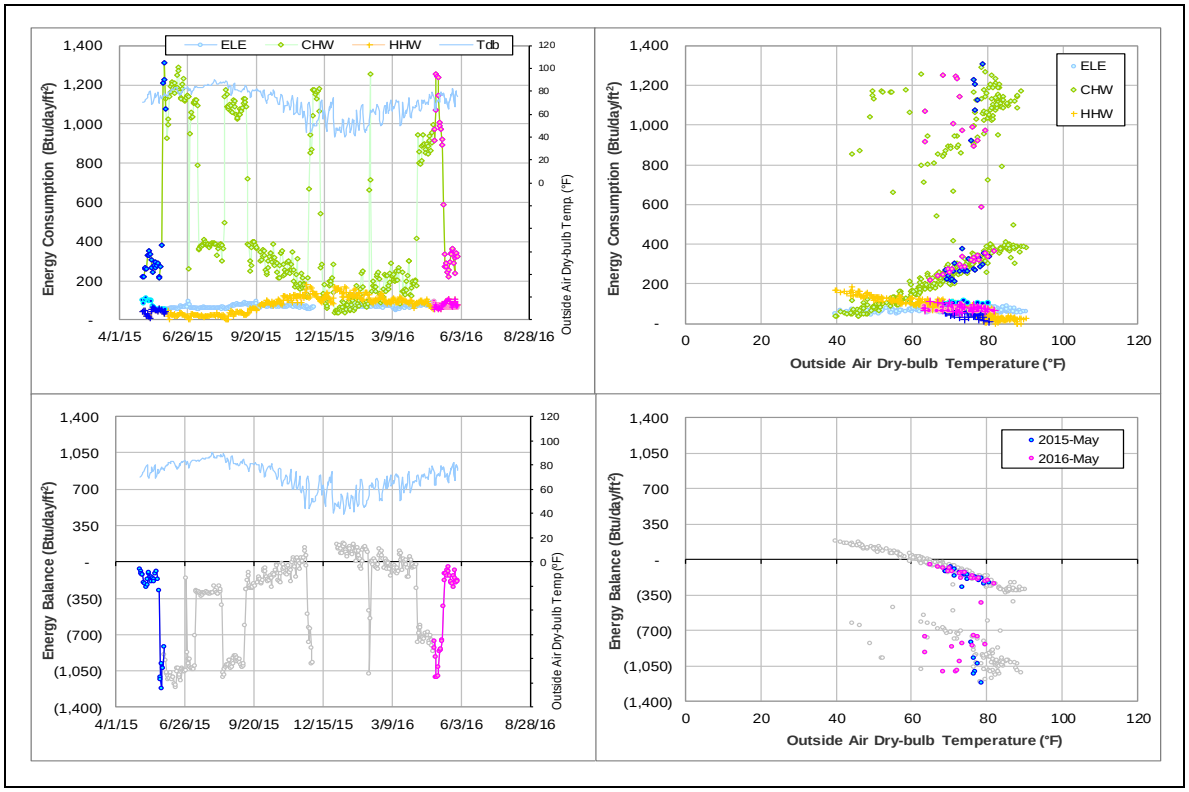
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
CHW	007918	4/10/2016 – 5/13/2016	Flow Rate	Increased

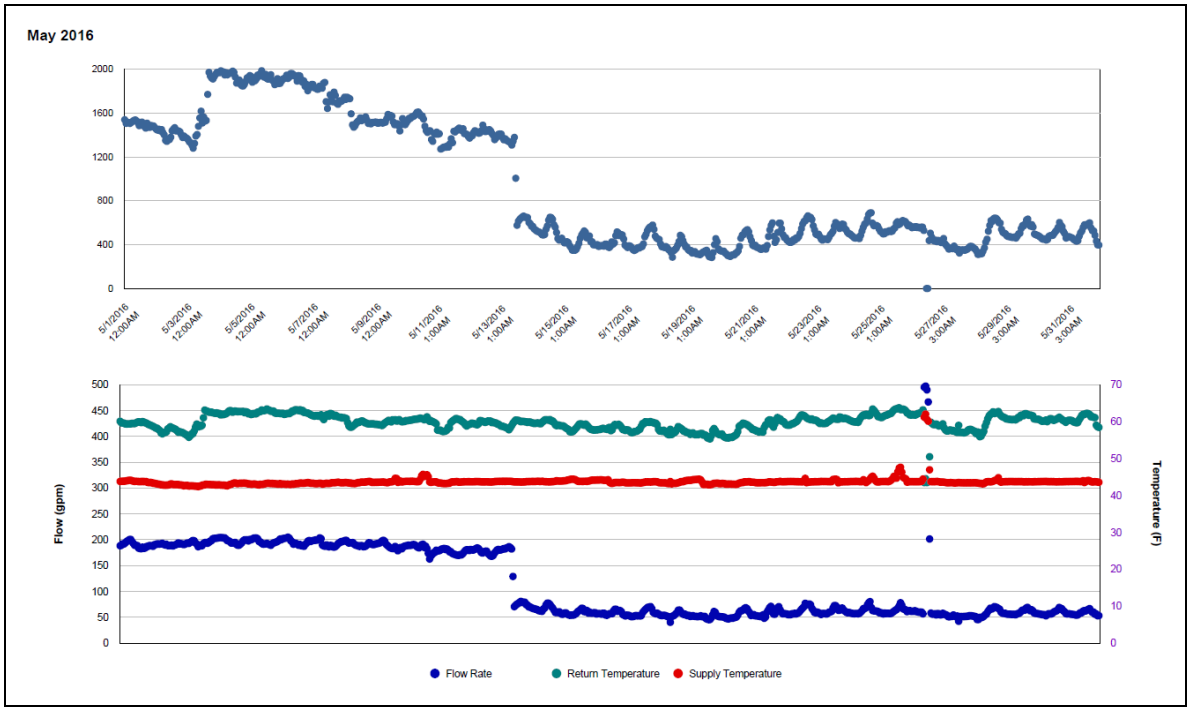
Quantitative descriptions and comments

The CHW consumption suddenly increased by 600-900 Btu/day/ft^2 during 4/10/2016-5/13/2016, as the CHW flow rate increased by 150 gpm. The consumption was estimated by a model.

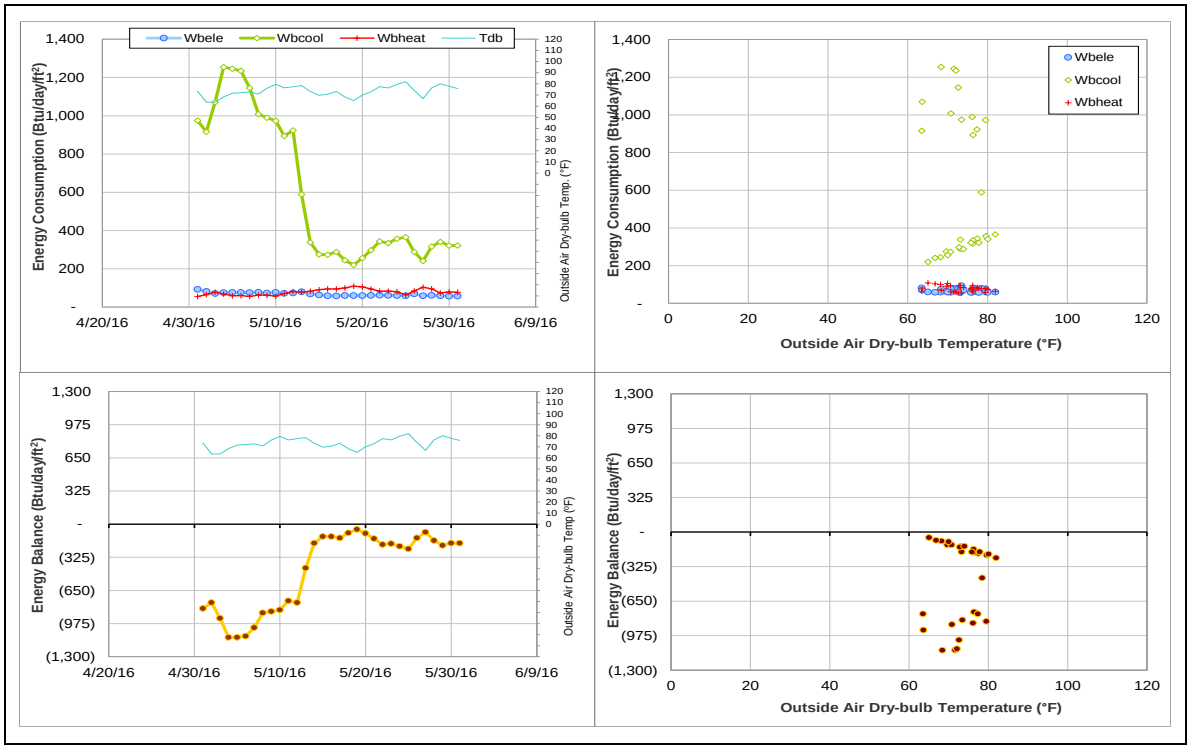
Explanatory Figure: 13 months energy balance plot with original data



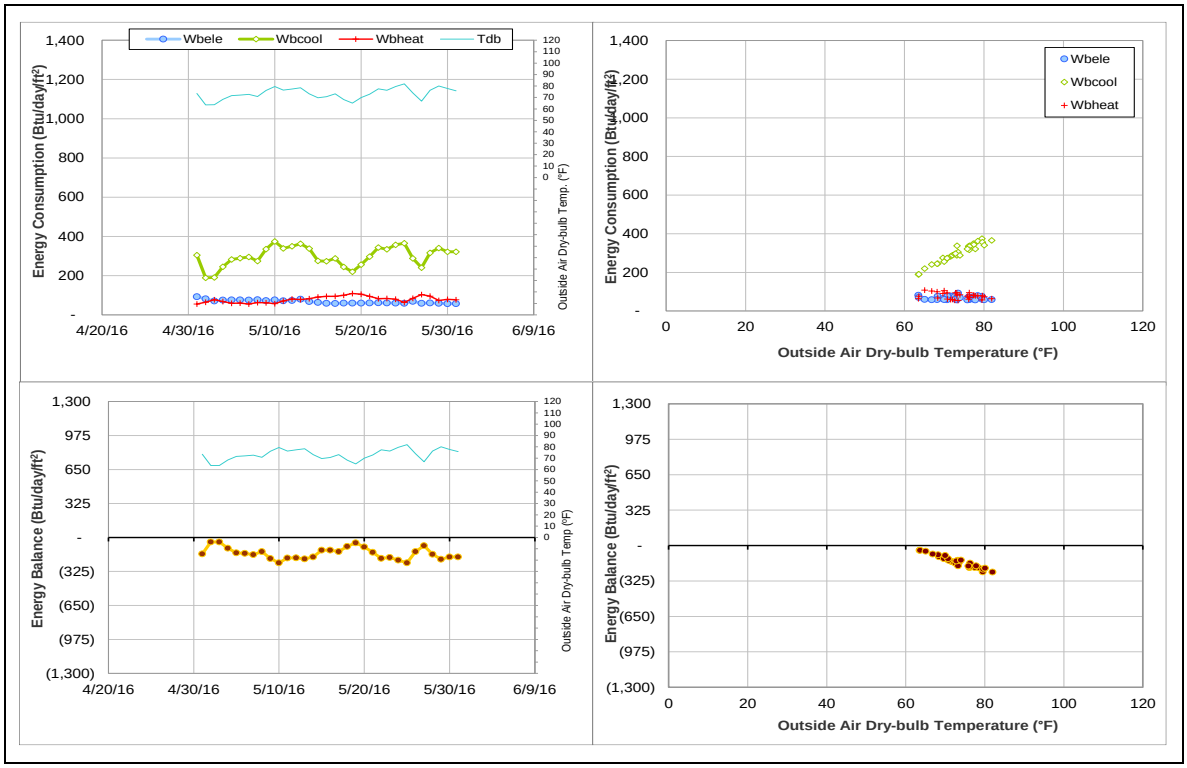
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (CHW meter during May 2016)



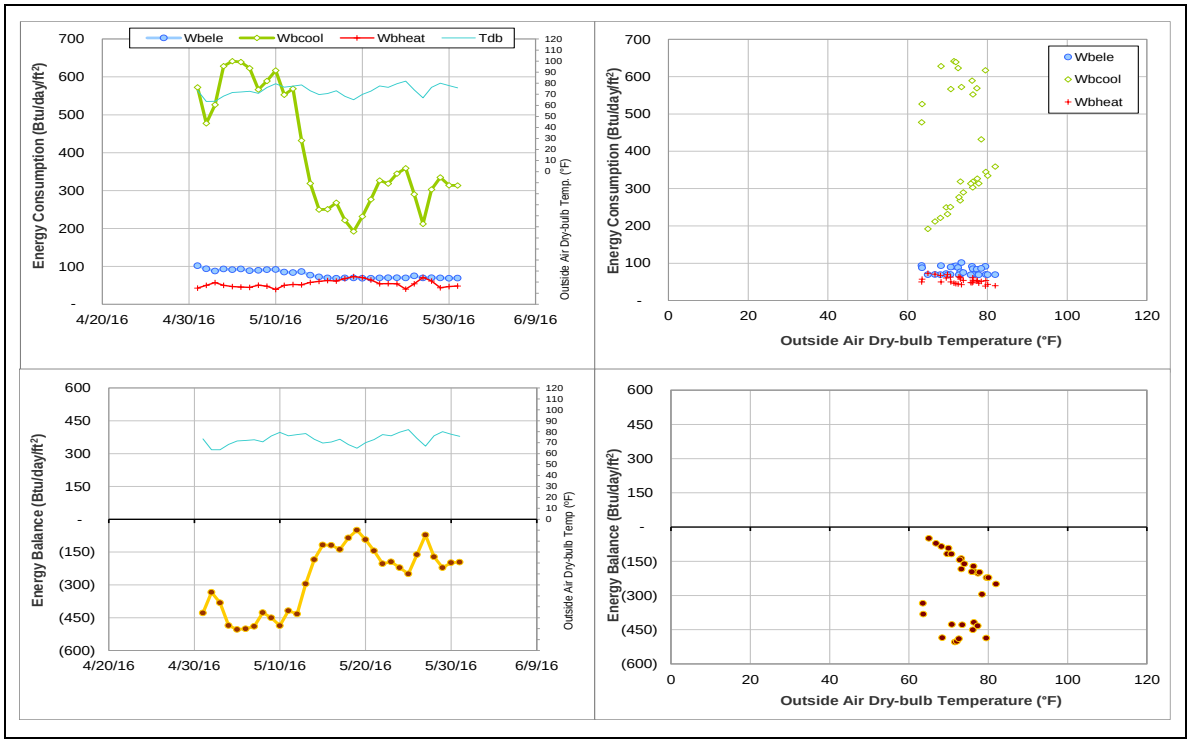
Energy balance plot using the original data for the month of analysis for Lacy Hall. Missing data have been filled in, if any.



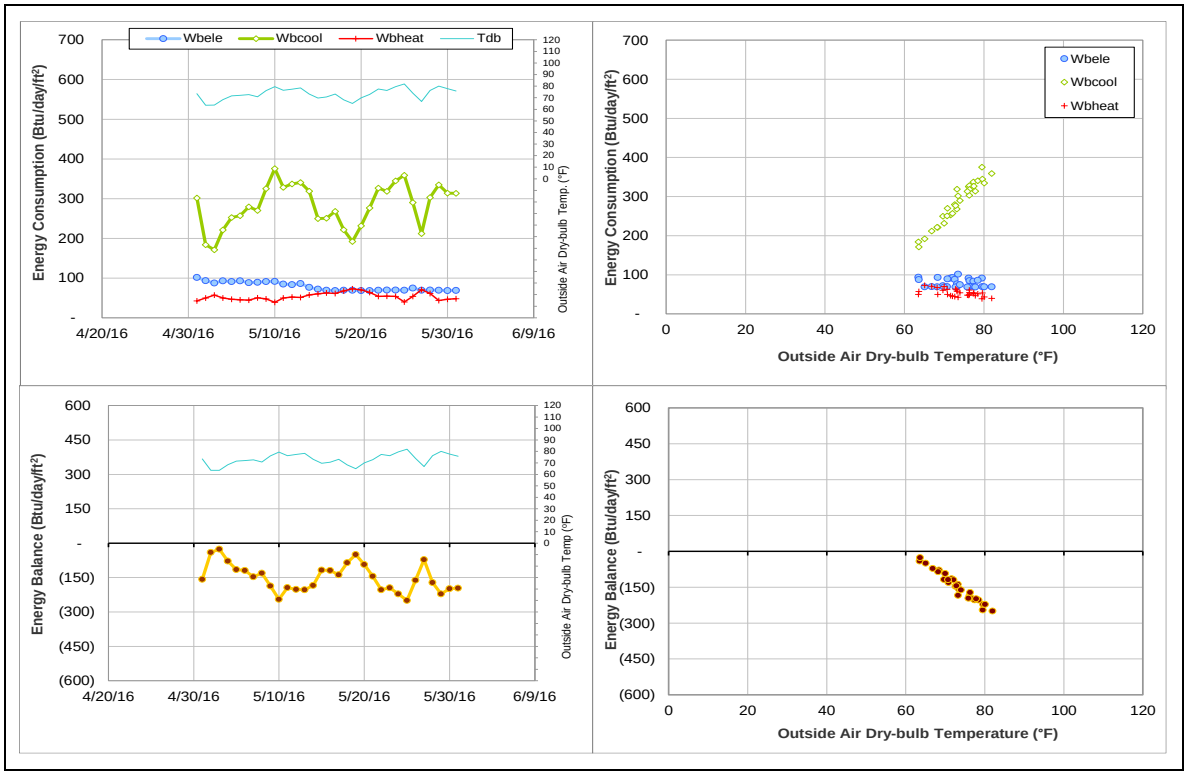
Energy balance plot using the estimated data for the month of analysis for Lacy Hall.



Energy balance plot using the original data for the month of analysis for Lacy Hall, Harrell Hall and Leadership Learning Center. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis for Lacy Hall, Harrell Hall and Leadership Learning Center.



Whitely Hall - Dorm 9 (TAMU Bldg #408)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
CHW	002079	6	5/20/2016 – 5/25/2016	Model
HHW	002083	6	5/20/2016 – 5/25/2016	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption level has decreased suddenly.	5/20/2016 – 5/25/2016
HHW	The consumption level has decreased suddenly.	5/20/2016 – 5/25/2016

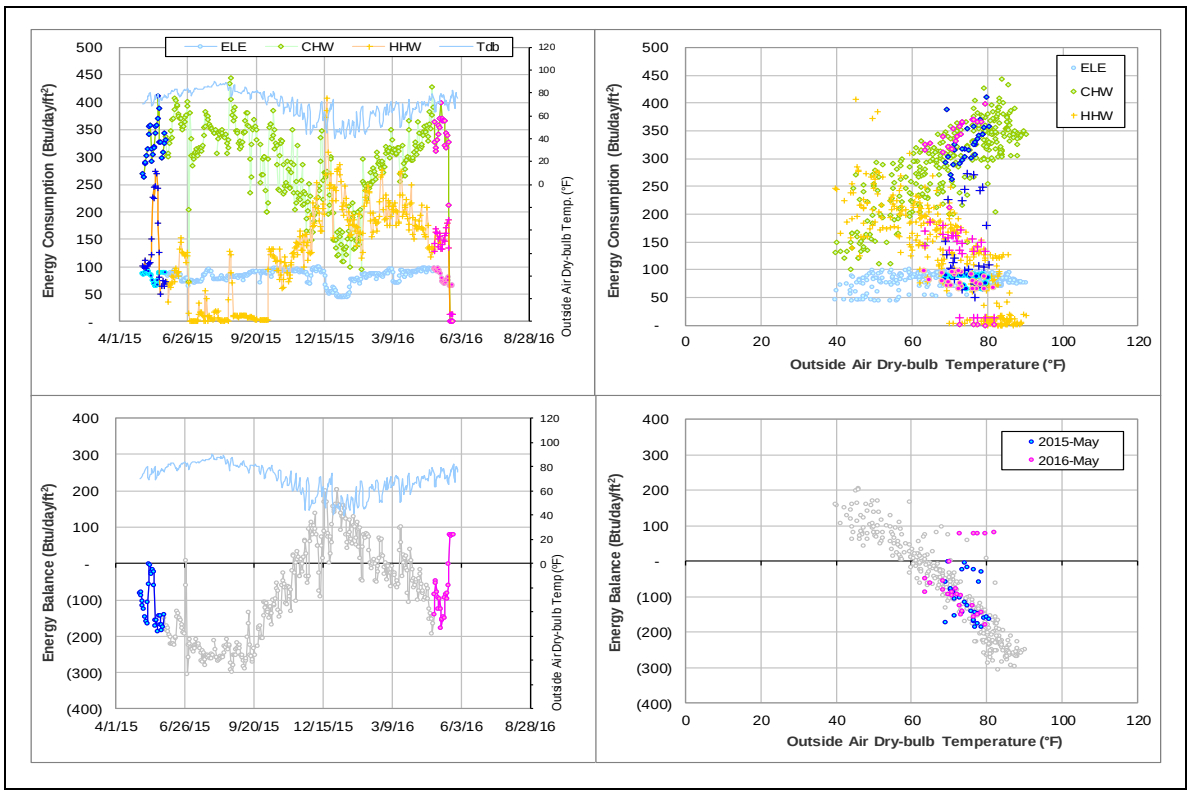
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
CHW	002079	5/20/2016 – 5/25/2016	Flow rate	Nearly zero, Faulty
HHW	002083	5/20/2016 – 5/25/2016	Flow rate	Nearly zero, Faulty

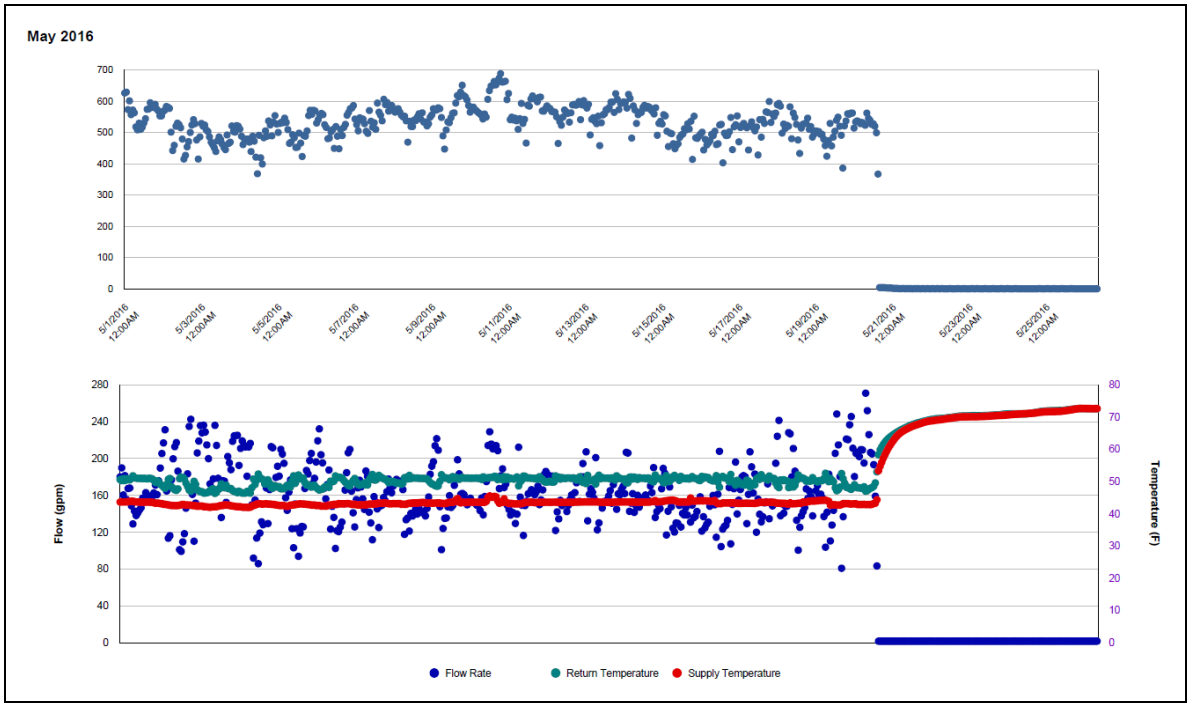
Quantitative descriptions and comments

Both the CHW and HHW consumption decreased to nearly zero during 5/20/2016-5/25/2016, as the CHW/HHW flow rate decreased to nearly zero. The consumption was estimated by models.

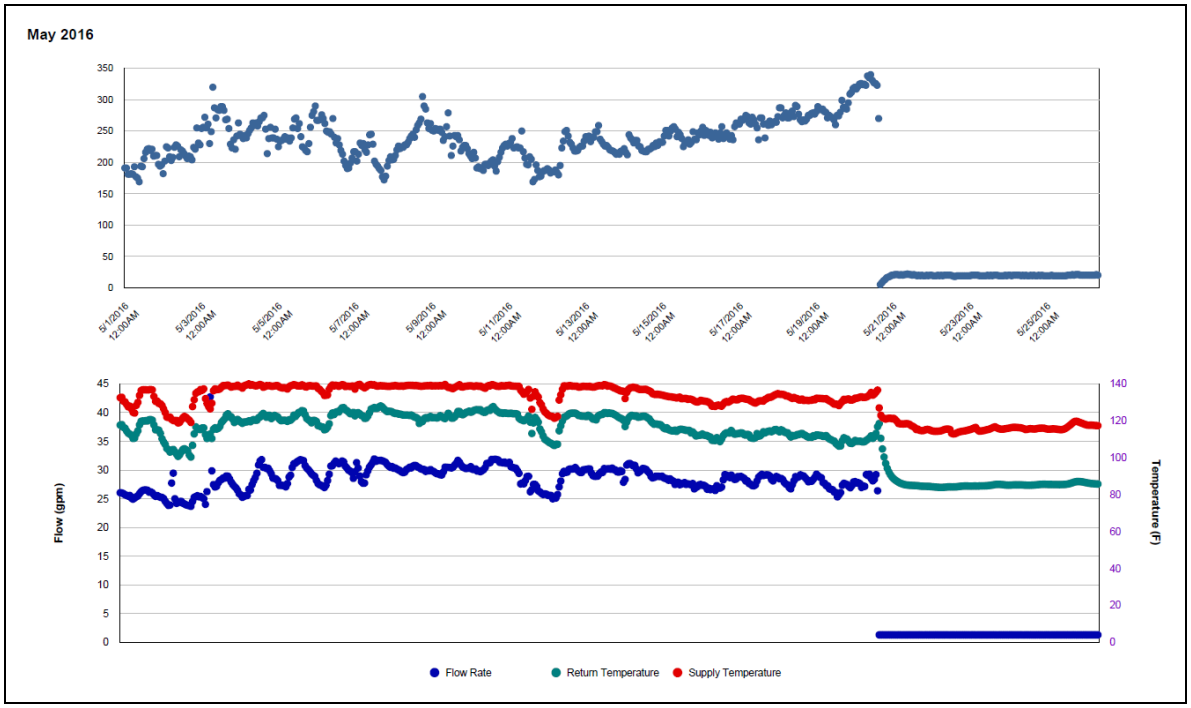
Explanatory Figure: 13 months energy balance plot with original data.



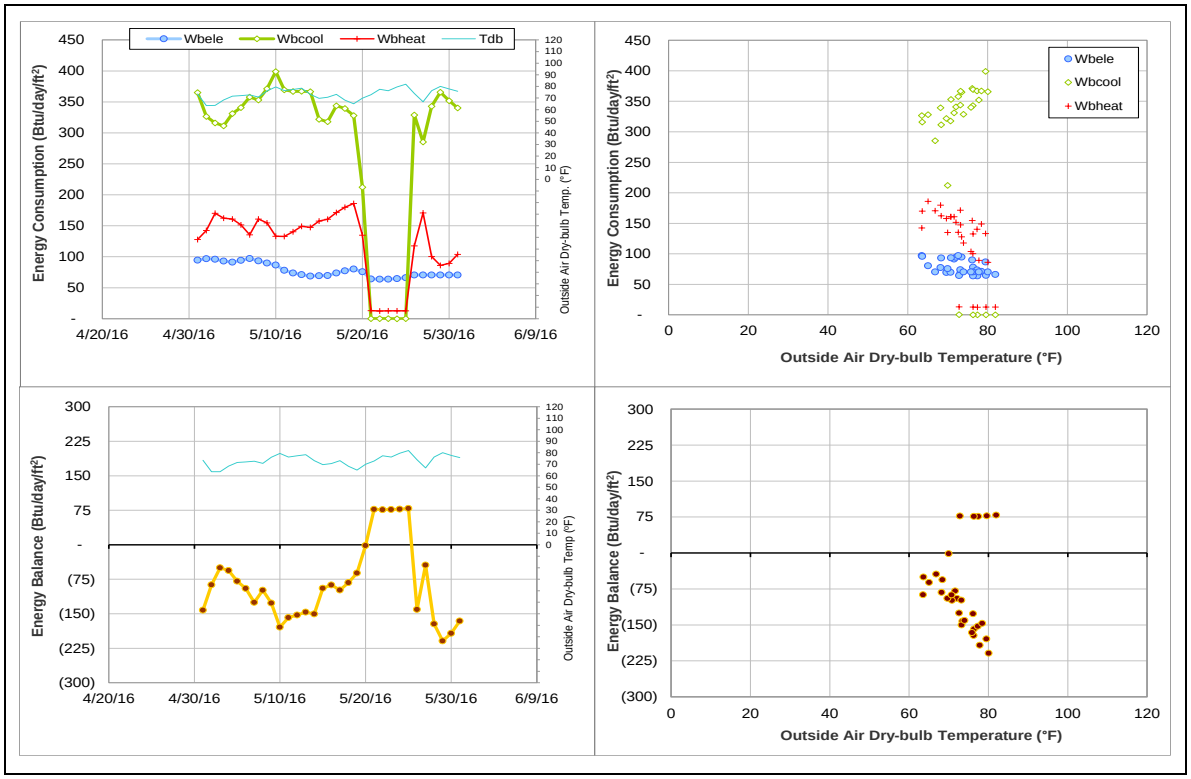
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (CHW meter during May 2016)



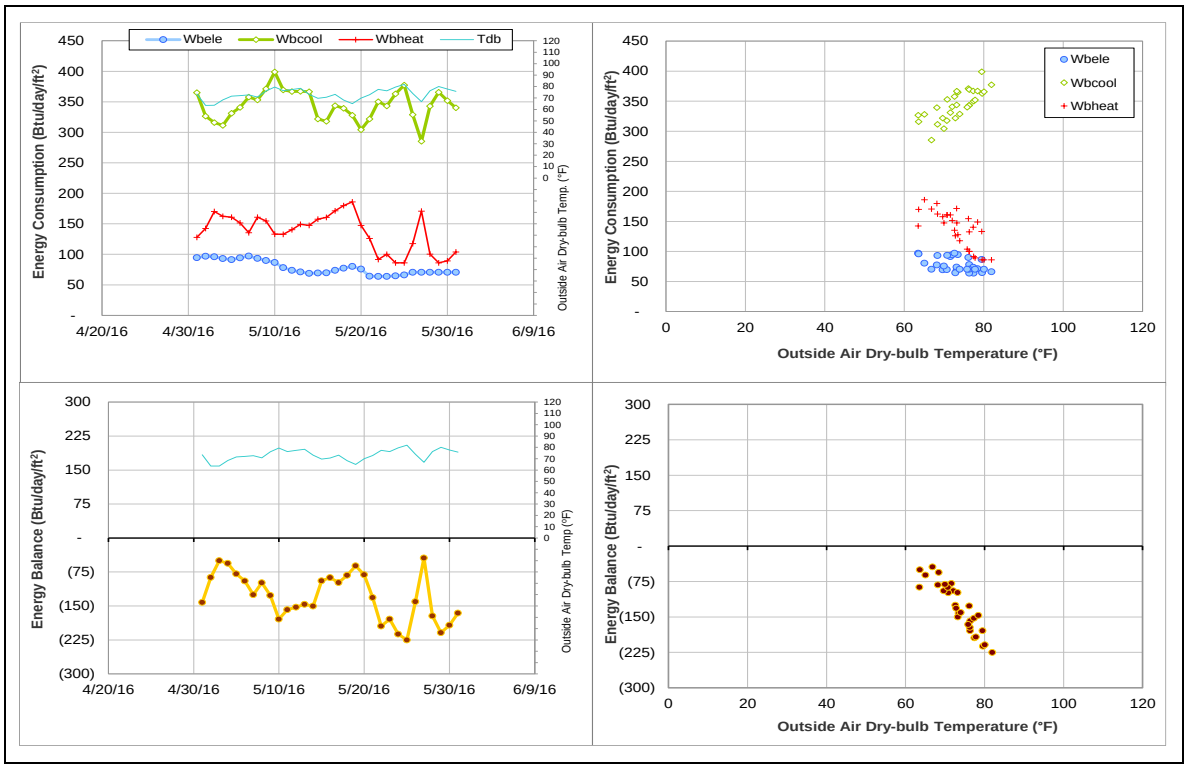
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (HHW meter during May 2016)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis.



Harrington Hall - Dorm 11 (TAMU Bldg #410)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
CHW	002349	4	5/20/2016 – 5/23/2016	Model
HHW	002353	4	5/20/2016 – 5/23/2016	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption level has decreased suddenly.	5/20/2016 – 5/23/2016
HHW	The consumption level has decreased suddenly.	5/20/2016 – 5/23/2016

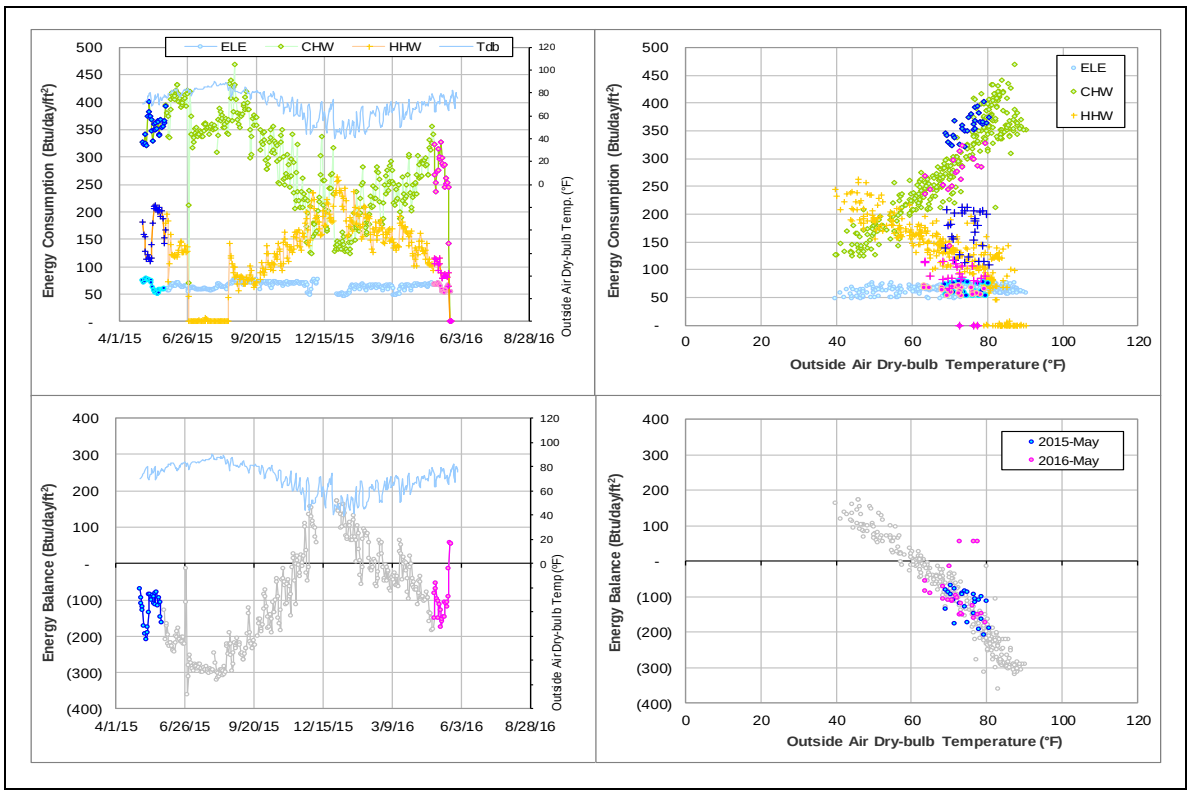
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
CHW	002349	5/20/2016 – 5/23/2016	Flow rate	Nearly zero, Faulty
HHW	002353	5/20/2016 – 5/23/2016	Flow rate	Nearly zero, Faulty

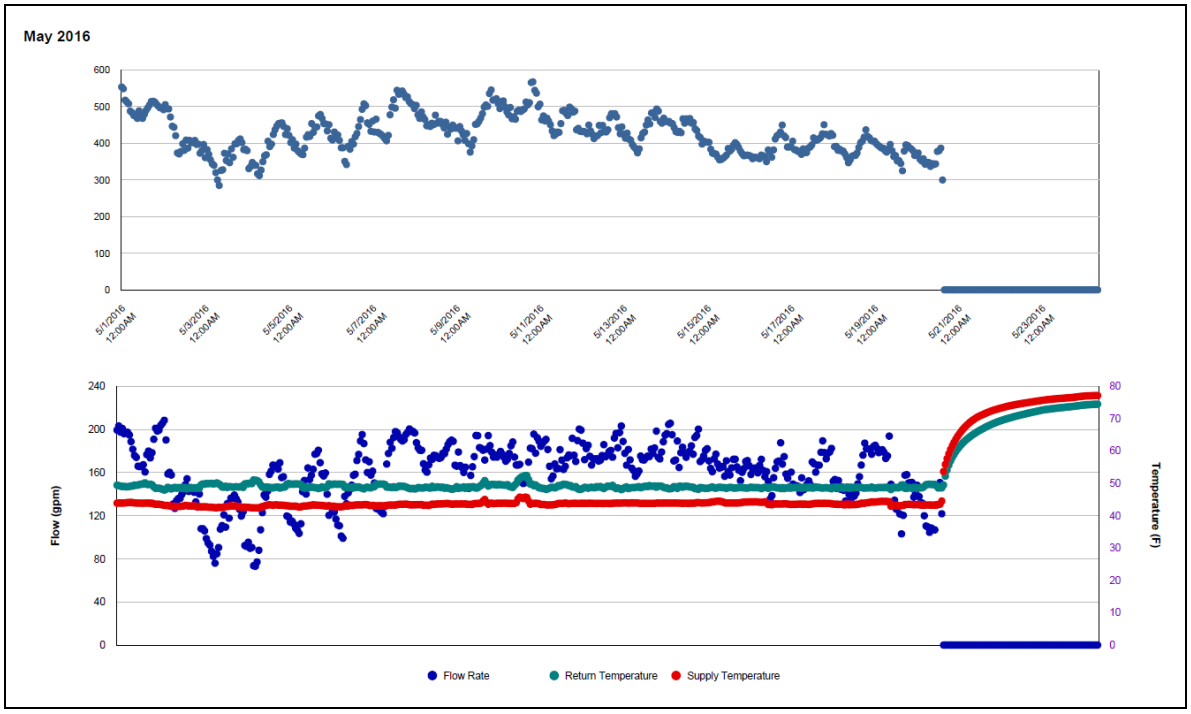
Quantitative descriptions and comments

Both the CHW and HHW consumption decreased to nearly zero during 5/20/2016-5/23/2016, as the CHW/HHW flow rate decreased to nearly zero. The consumption was estimated by models.

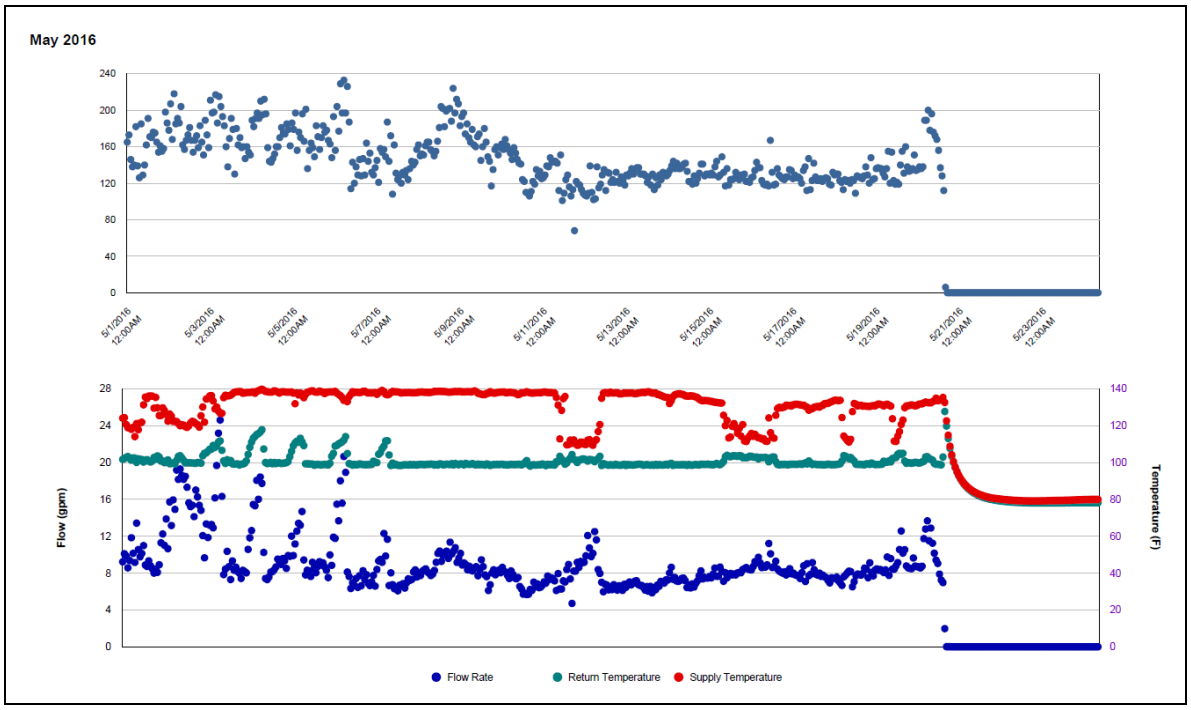
Explanatory Figure: 13 months energy balance plot with original data.



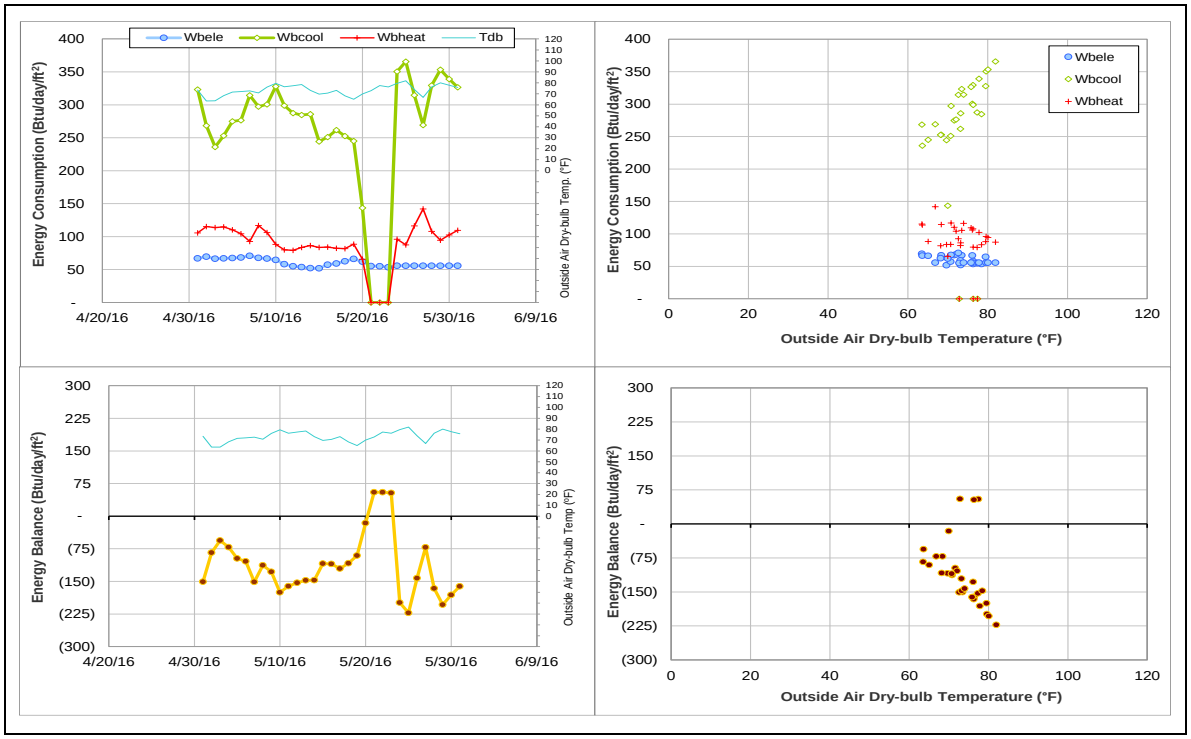
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (CHW meter during May 2016)



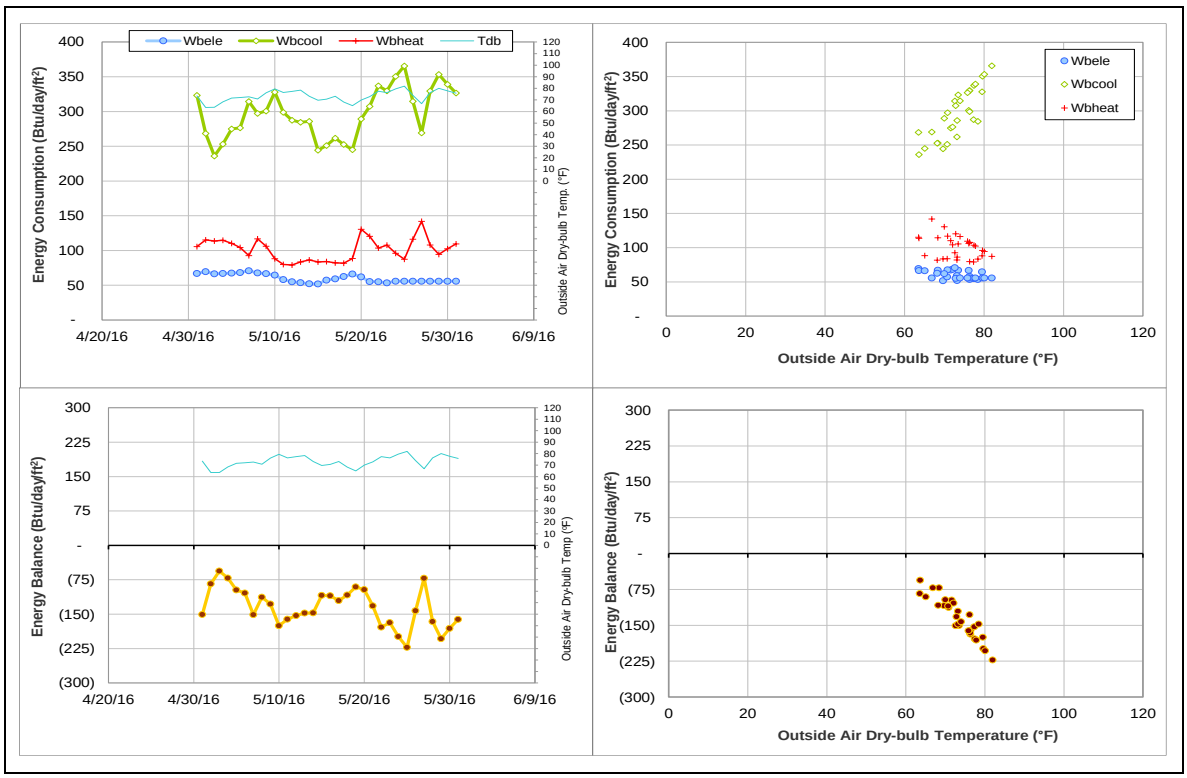
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (HHW meter during May 2016)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis.



Krueger Residence Hall (TAMU Bldg #441)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
CHW	002504	16	5/16/2016 – 5/31/2016	Model
HHW	002500	16	5/16/2016 – 5/31/2016	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption level has decreased suddenly.	5/16/2016 – ongoing
HHW	The consumption level has decreased suddenly.	5/16/2016 – ongoing

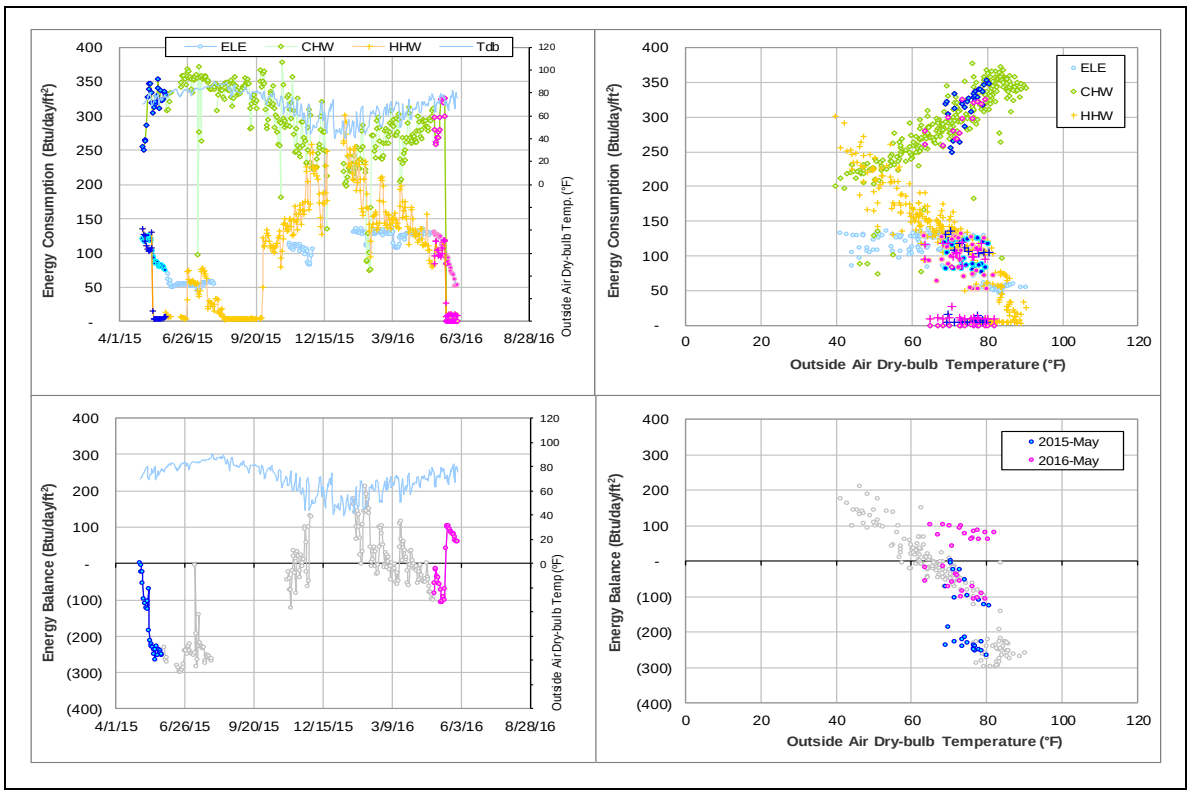
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
CHW	002504	5/16/2016 – ongoing	Flow rate	Nearly zero, Faulty
HHW	002500	5/16/2016 – ongoing	Flow rate	Nearly zero, Faulty

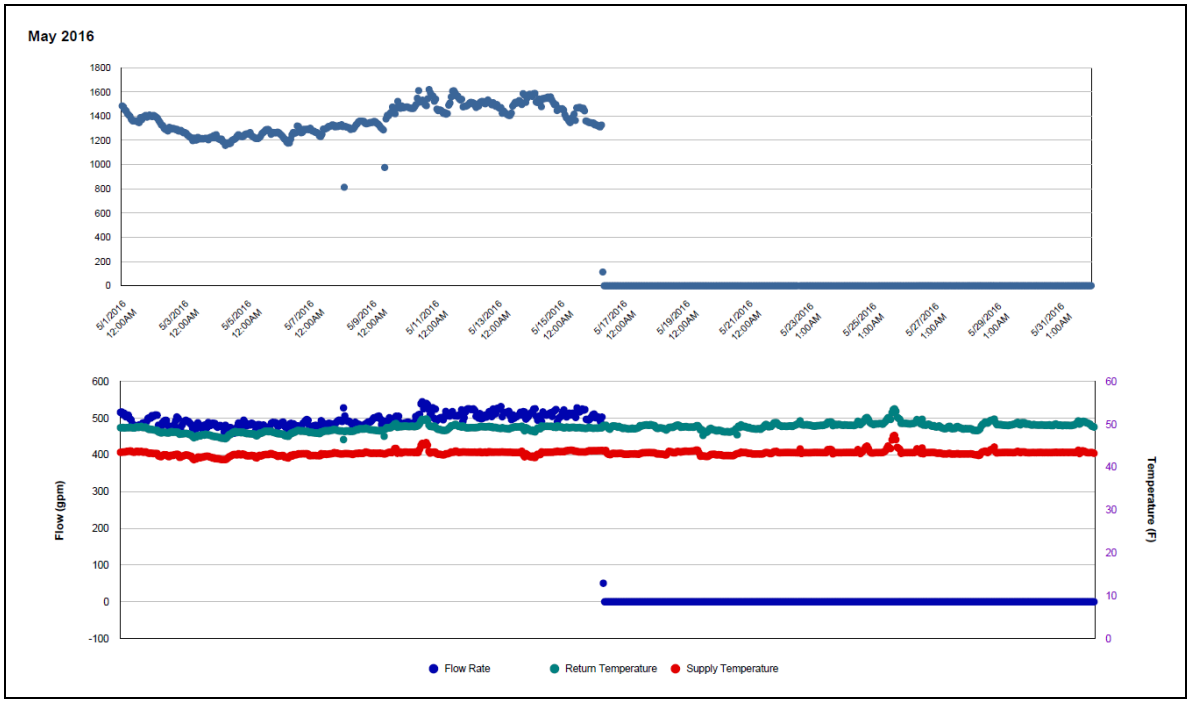
Quantitative descriptions and comments

Both the CHW and HHW consumption decreased to nearly zero during 5/16/2016-5/31/2016, as the CHW/HHW flow rate decreased to nearly zero. The consumption was estimated by models.

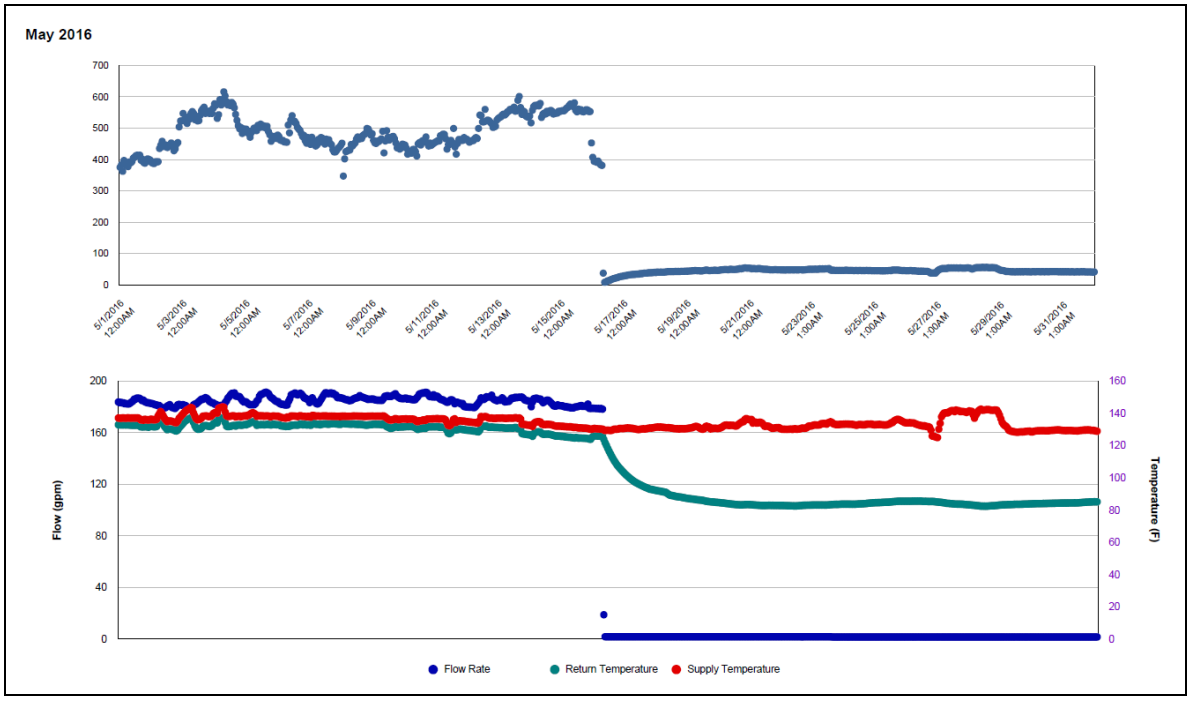
Explanatory Figure: 13 months energy balance plot with original data.



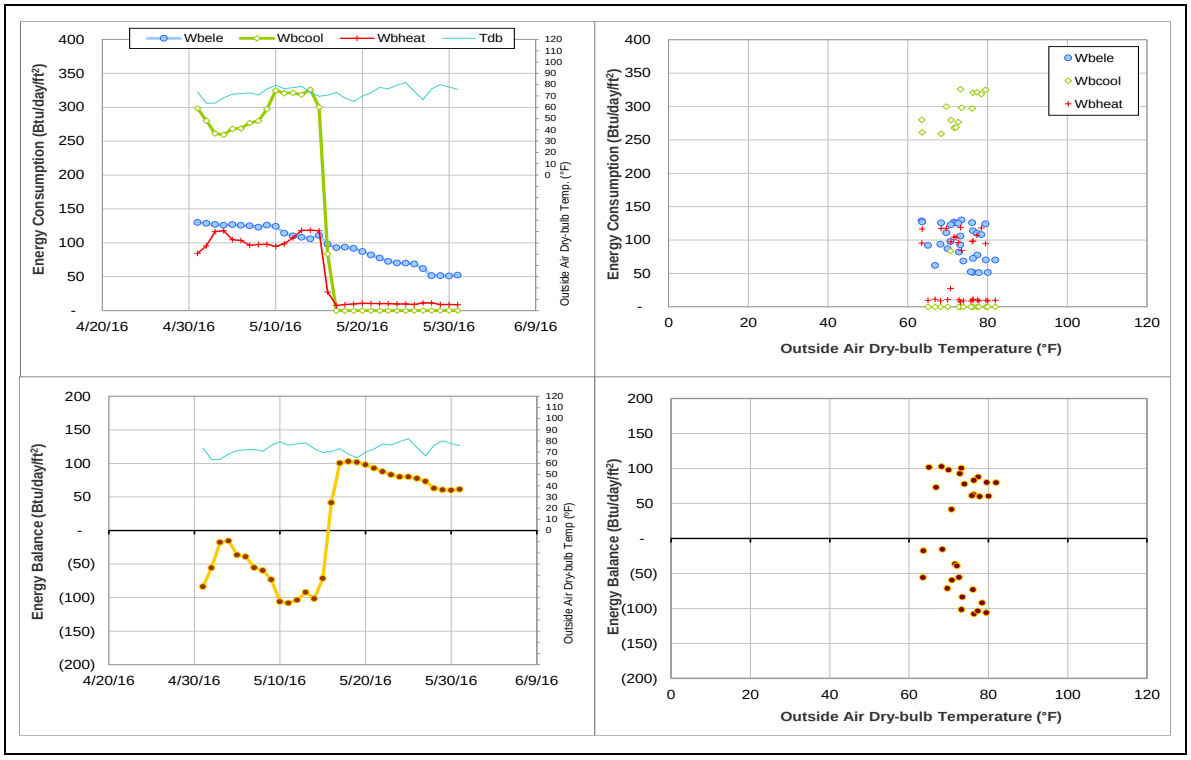
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (CHW meter during May 2016)



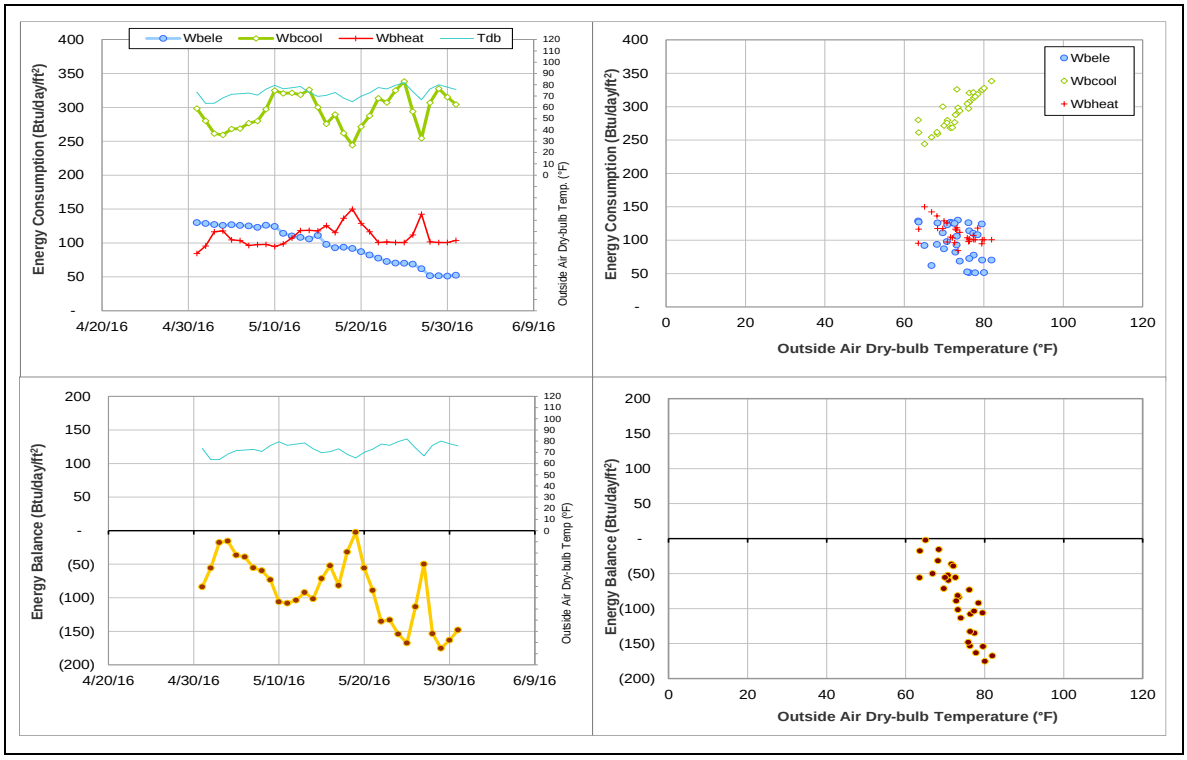
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (HHW meter during May 2016)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis.



Peterson Building (TAMU Bldg #444)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
ELE	004714	6	5/5/2016 – 5/10/2016	Average

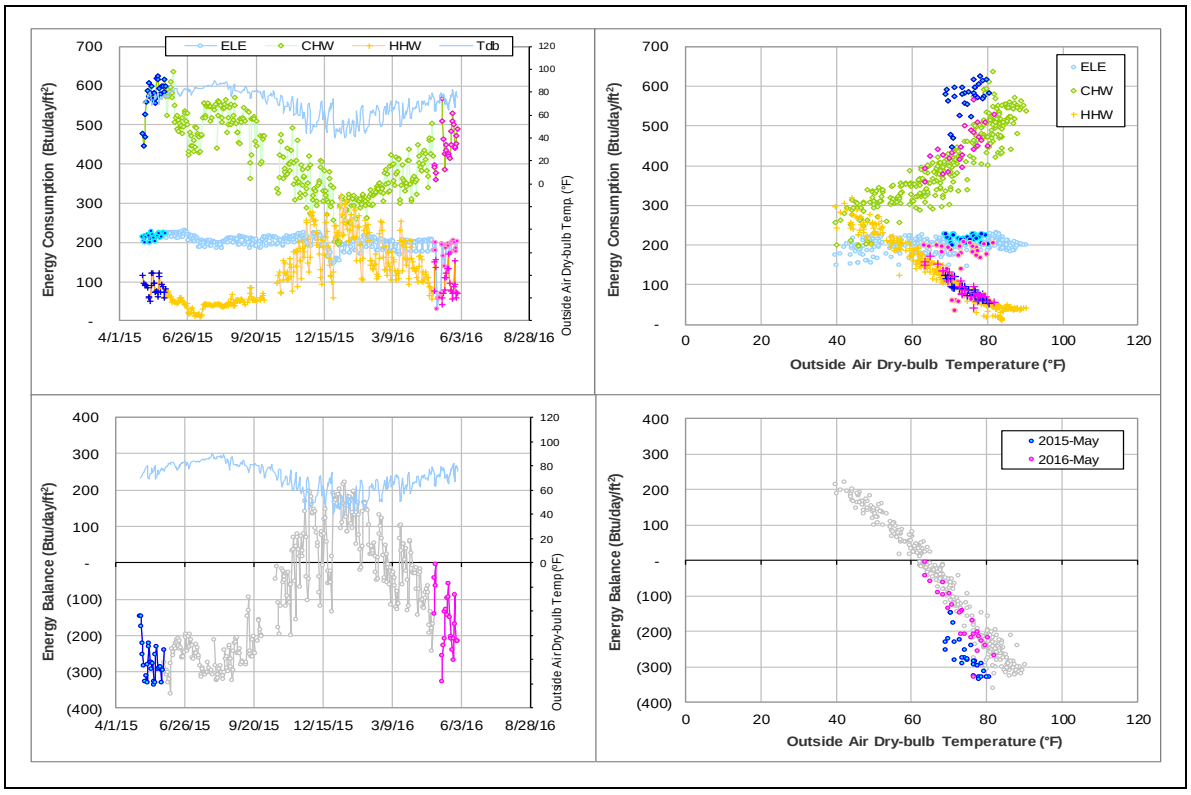
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE	The consumption dropped for a short period.	5/5/2016 – 5/10/2016

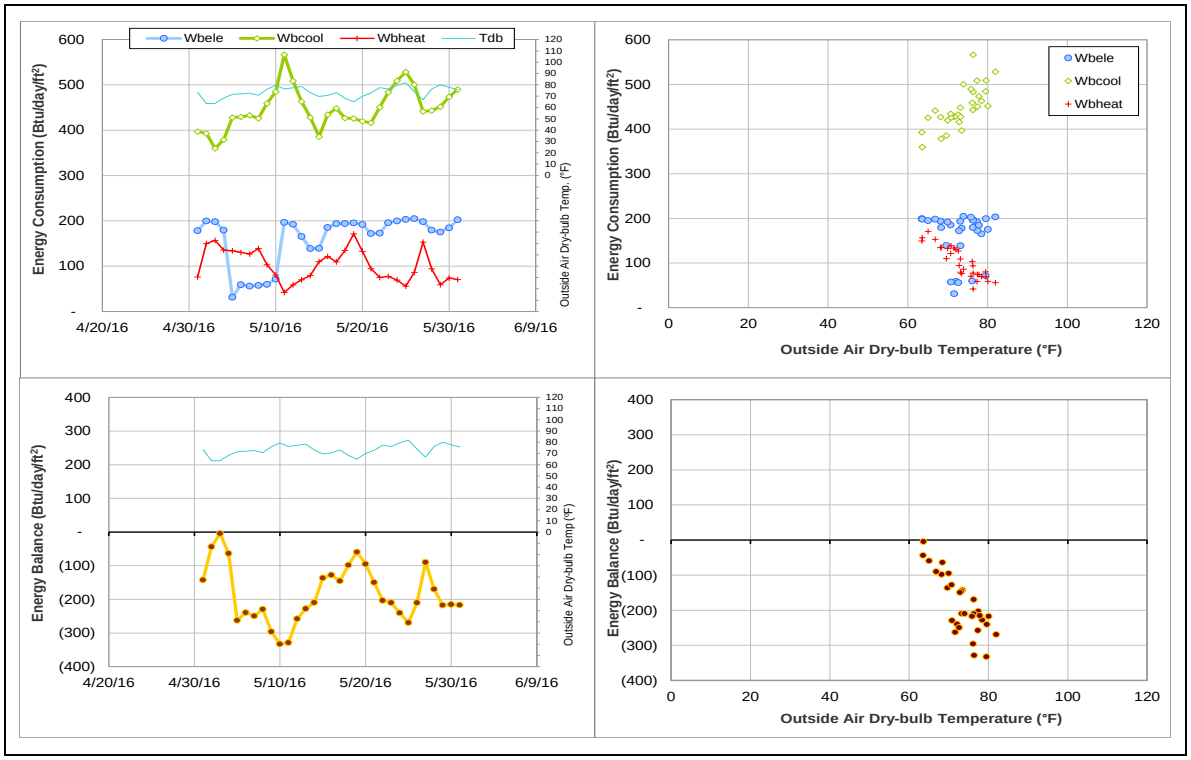
Quantitative descriptions and comments

The ELE consumption suddenly decreased about 150 Btu/day/ft^2 during 5/5/2016-5/10/2016, and the consumption was estimated by an average of the rest days in this month.

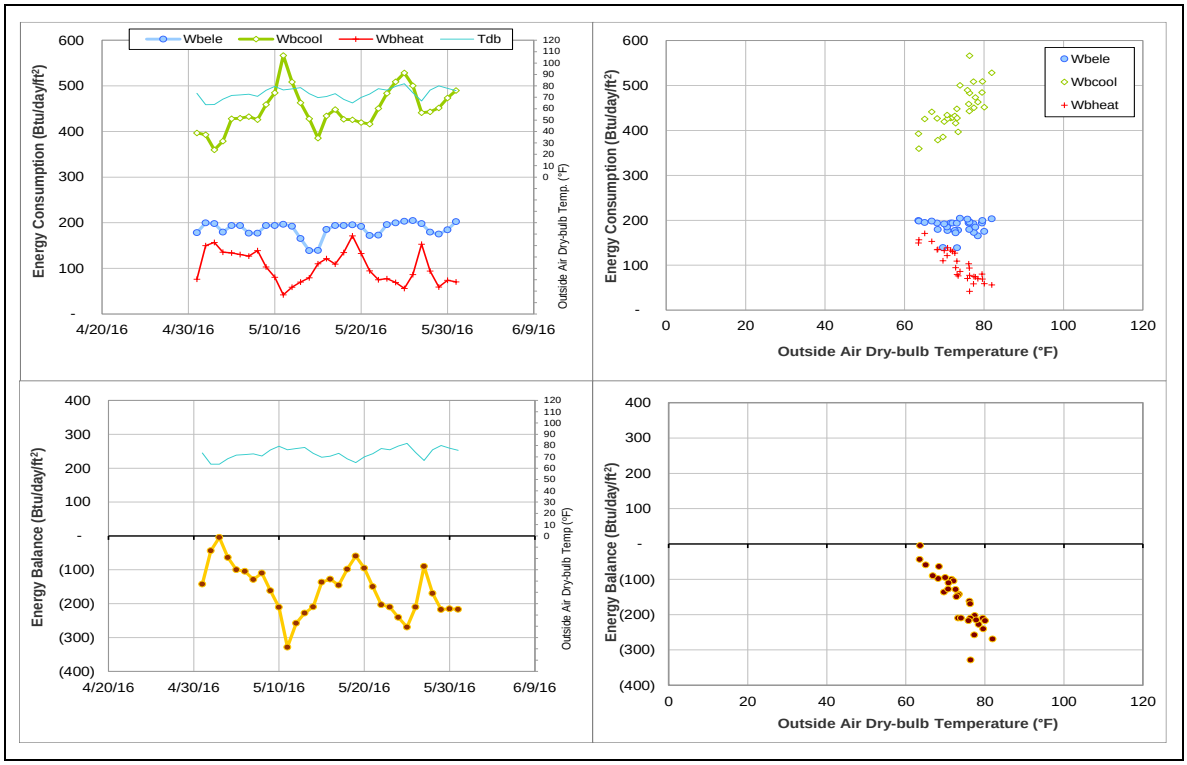
Explanatory Figure: 13 months energy balance plot with original data.



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis.



Evans Library (TAMU Bldg #468)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
CHW	003895	14	5/18/2016 – 5/31/2016	Average
HHW	003899	17	5/11/2016 – 5/13/2016, 5/18/2016 – 5/31/2016	Average

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption level has increased suddenly. The metered value appeared to be faulty.	5/18/2016 – ongoing
HHW	The consumption level has decreased suddenly. The metered value appeared to be faulty.	5/11/2016 – 5/13/2016, 5/18/2016 – ongoing

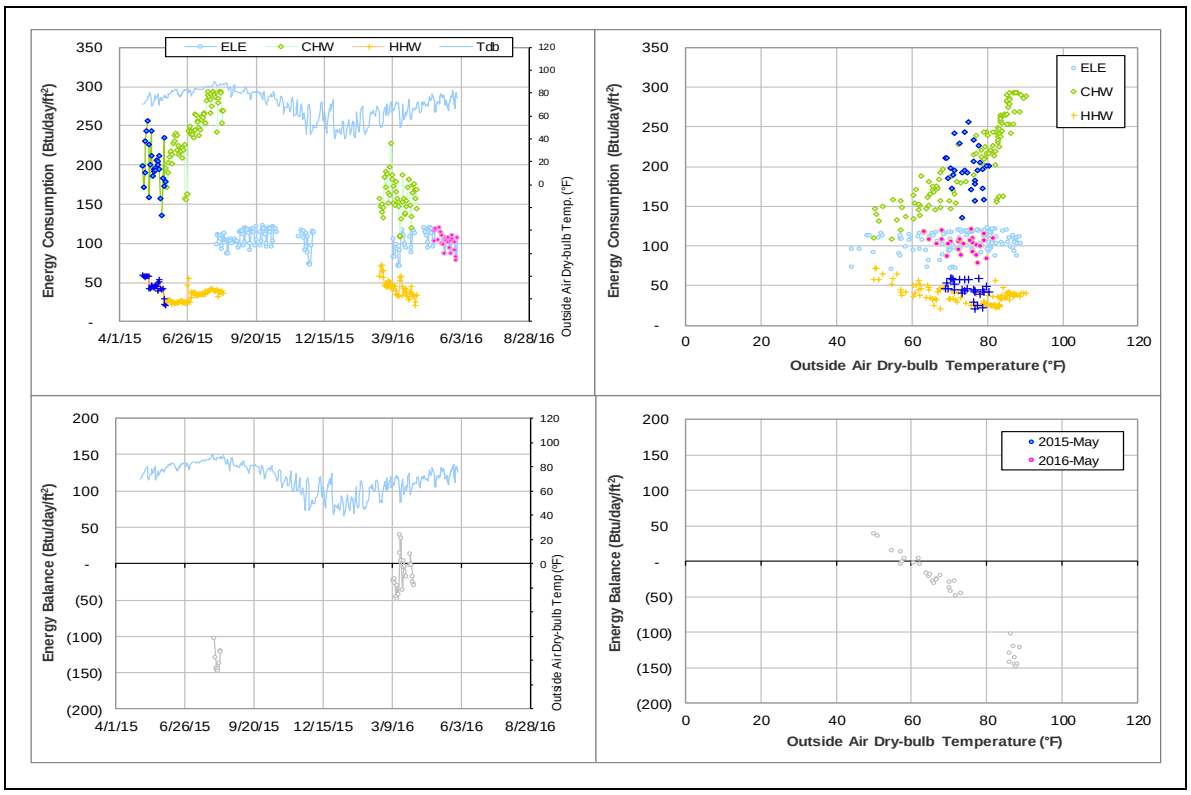
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
CHW	003895	5/18/2016 – ongoing	Supply Temperature	Zero, Faulty
HHW	003899	5/11/2016 – 5/13/2016	Flow rate	Zero, Faulty
			Supply Temperature	Decreased
		5/18/2016 – ongoing	Return Temperature	Increased

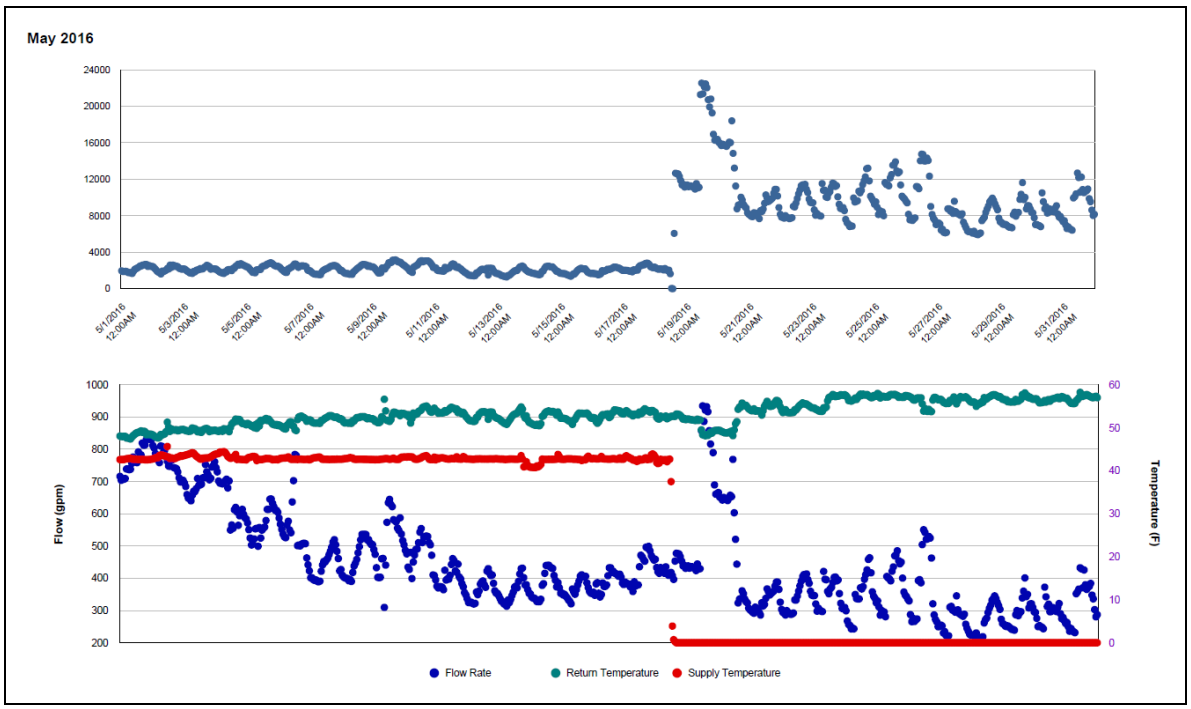
Quantitative descriptions and comments

The CHW (Meter ID: 003895) consumption suddenly increased 300 Btu/day/ft^2 since 5/18/2016, as the supply temperature decreased to zero. The HHW (Meter ID: 003899) consumption decreased to zero during 5/11/2016-5/13/2016 and 5/18/2016-5/31/2016. The HHW flow rate was zero, while the supply temperature decreased to be lower than the return temperature during 5/11/2016-5/13/2016. During 5/18/2016-5/31/2016, the HHW return temperature increased to be higher than the supply temperature. The consumption was estimated by models.

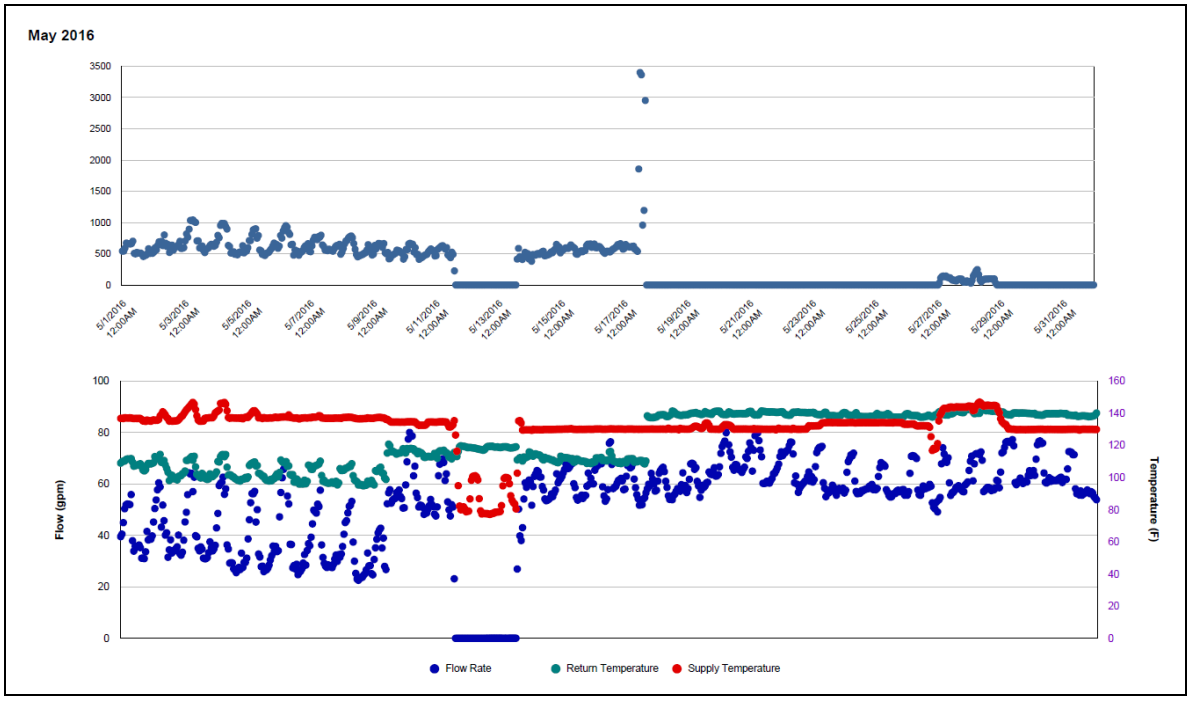
Explanatory Figure: 13 months energy balance plot with original data.



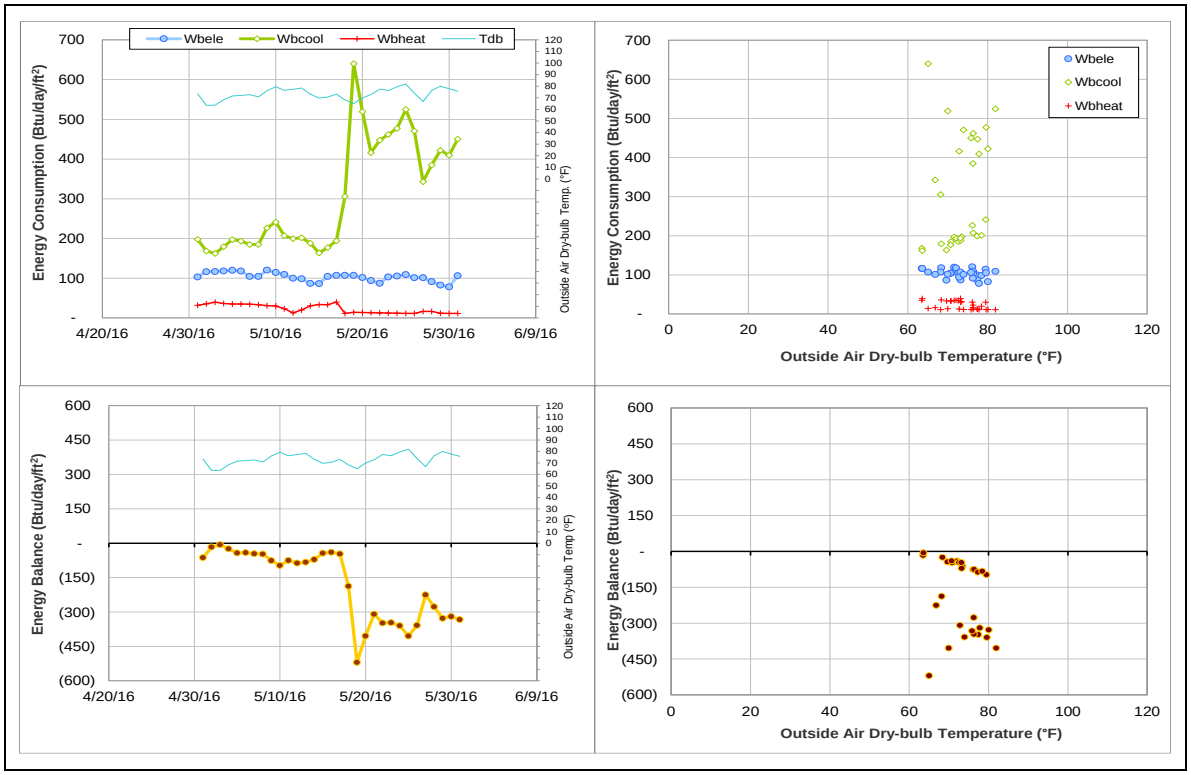
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (CHW meter 003895 during May 2016)



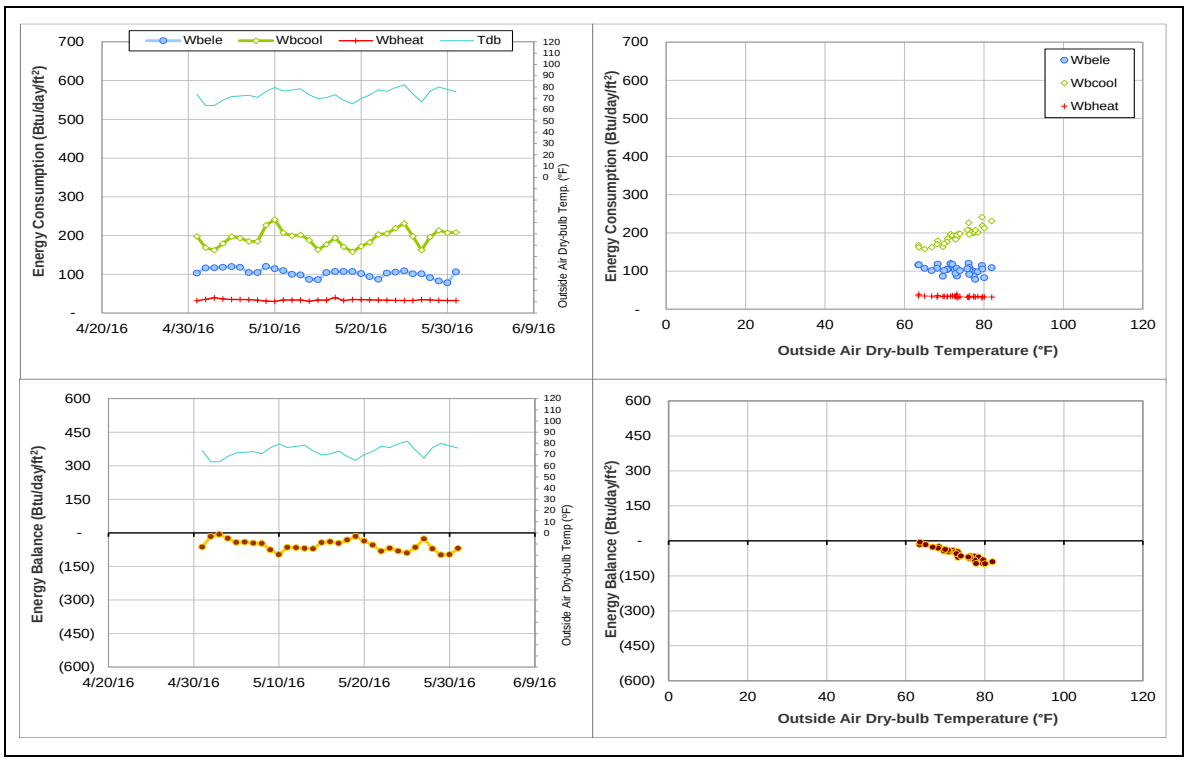
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (HHW meter 003899 during May 2016)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis.



Beutel Health Center (TAMU Bldg # 520)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
CHW	003933	31	5/1/2016 – 5/31/2016	Model
HHW	003944	31	5/1/2016 – 5/31/2016	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption level decreased.	8/22/2015-ongoing
HHW	The consumption level decreased.	8/22/2015-ongoing

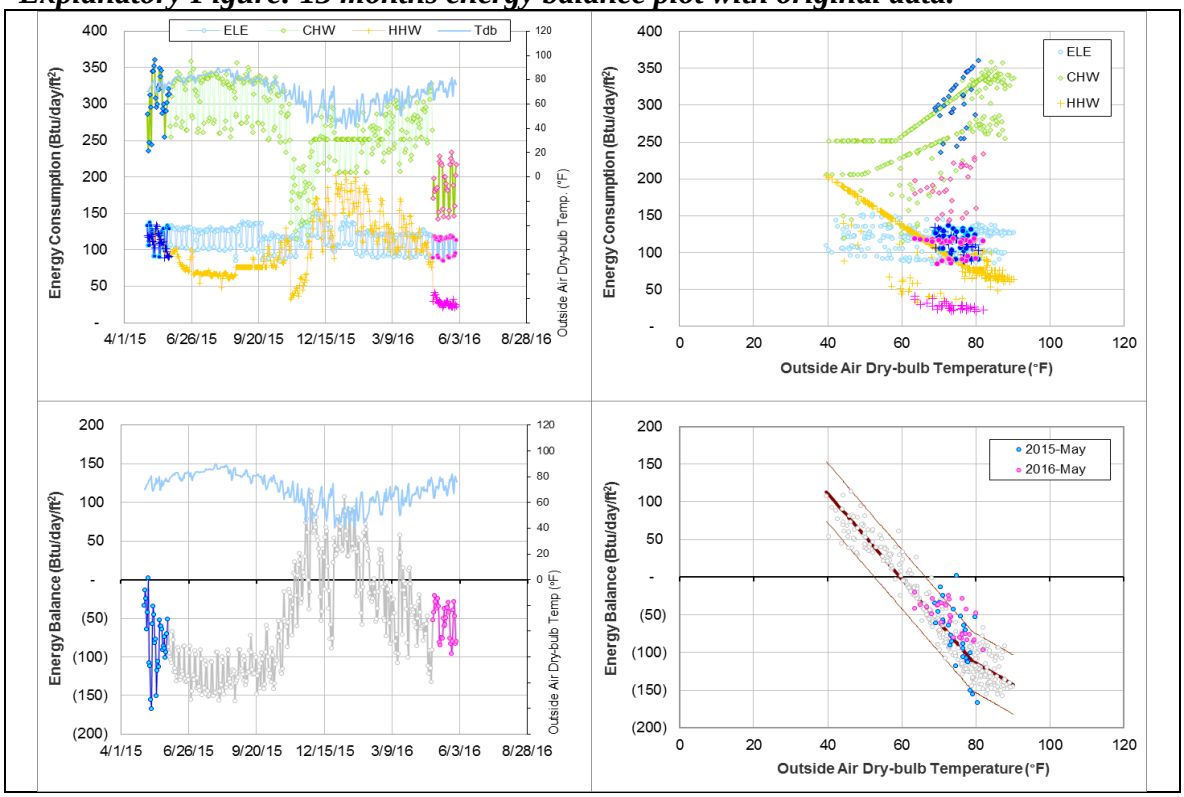
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
CHW	003933	8/22/2015 – 9/19/2015	Flow Rate	Decreased
		8/22/2015 - ongoing	Delta-T	Decreased
HHW	003944	8/22/2015 - ongoing	Delta-T	Decreased and small

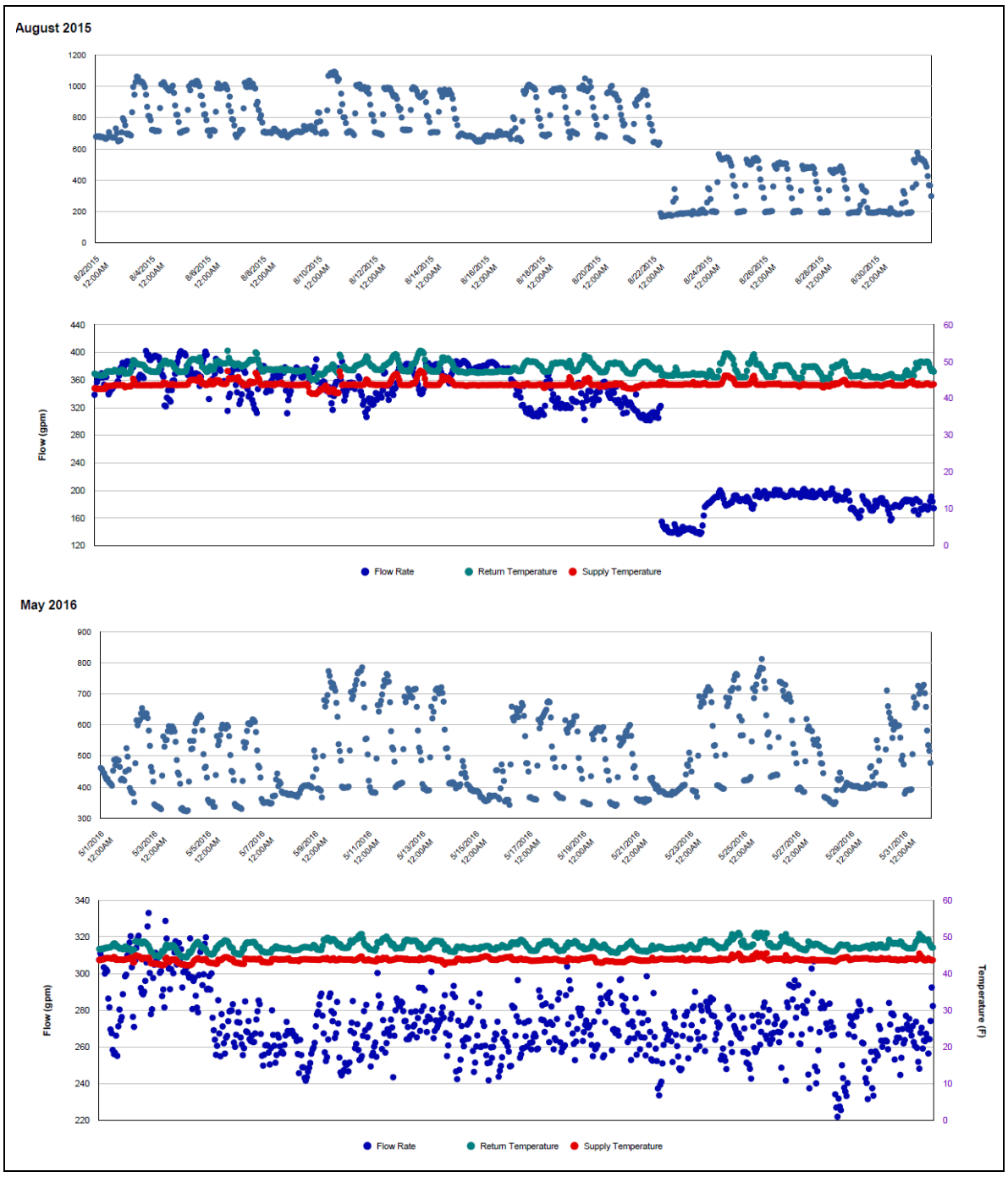
Quantitative descriptions and comments

The return temperature for HHW meter increased and the delta-T decreased since 8/22/2015. At the same time, the flow rate decreased around 50%. As a result, the HHW consumption decreased largely (~80%). The CHW consumption also decreased by approximately 50% after 8/22/2015 caused by a decrease in flow rate. The flow rate increased back on 9/19/2015, but the consumption level for current month is 100 Btu/day/ft^2 lower than that before 8/22/2015. The consumption was estimated by models based on the data during 8/1/2014 - 7/31/2015. We would like to know if this building has been renovated recently.

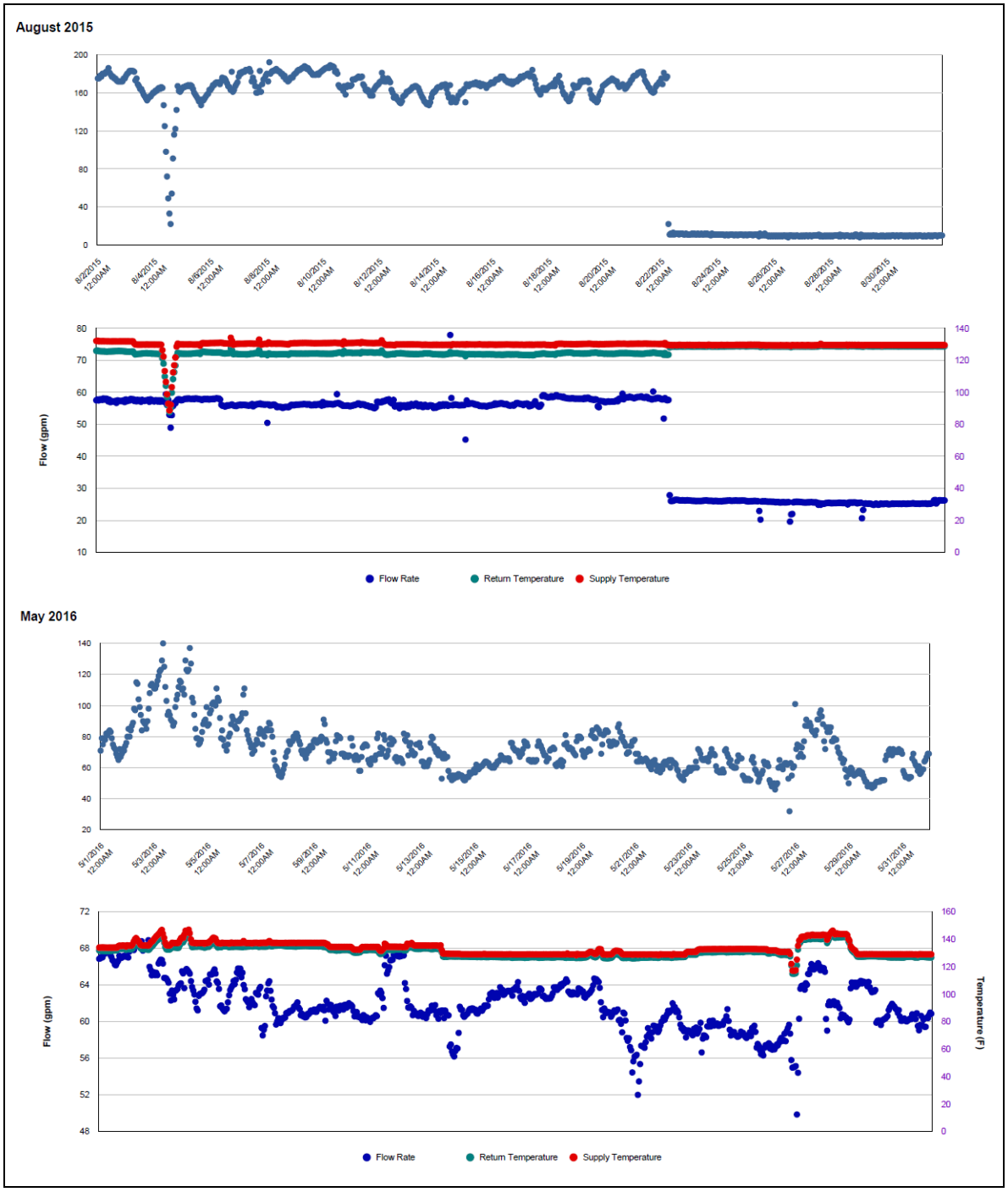
Explanatory Figure: 13 months energy balance plot with original data.



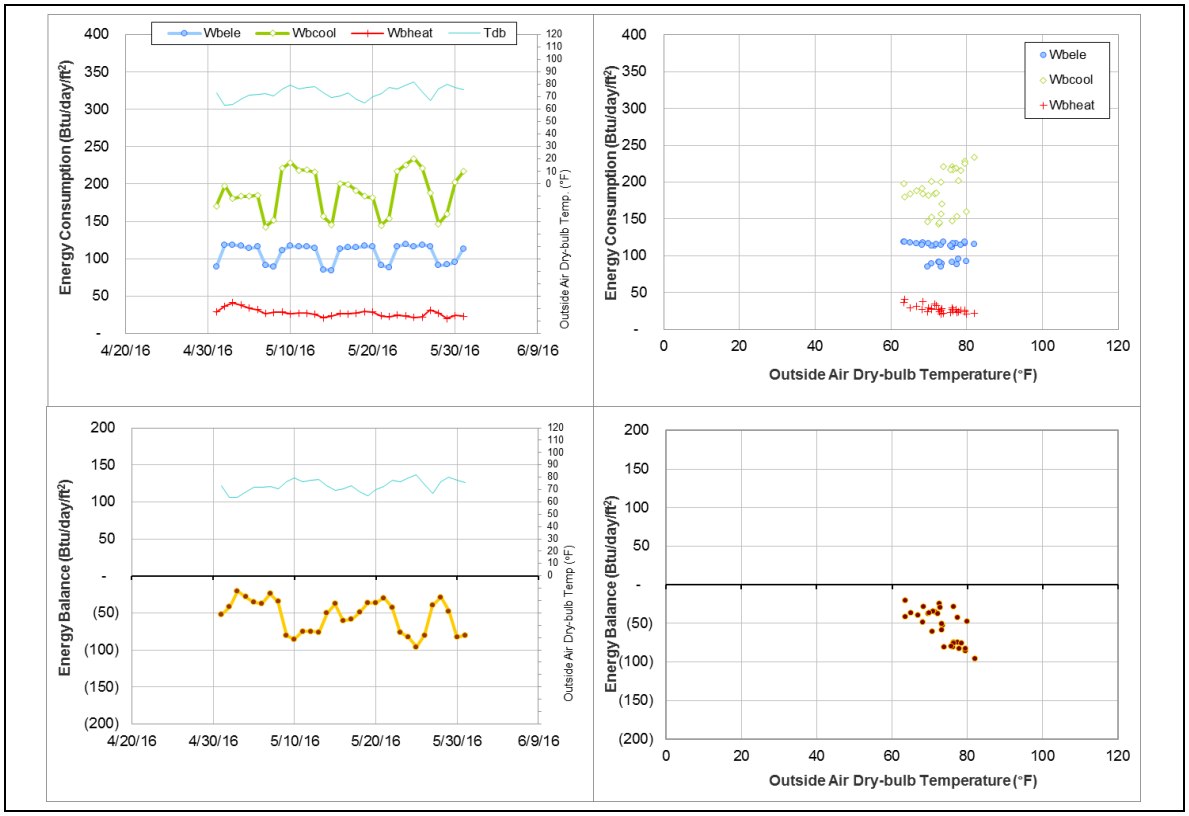
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (CHW meter during August 2015 (top) and May 2016 (bottom))



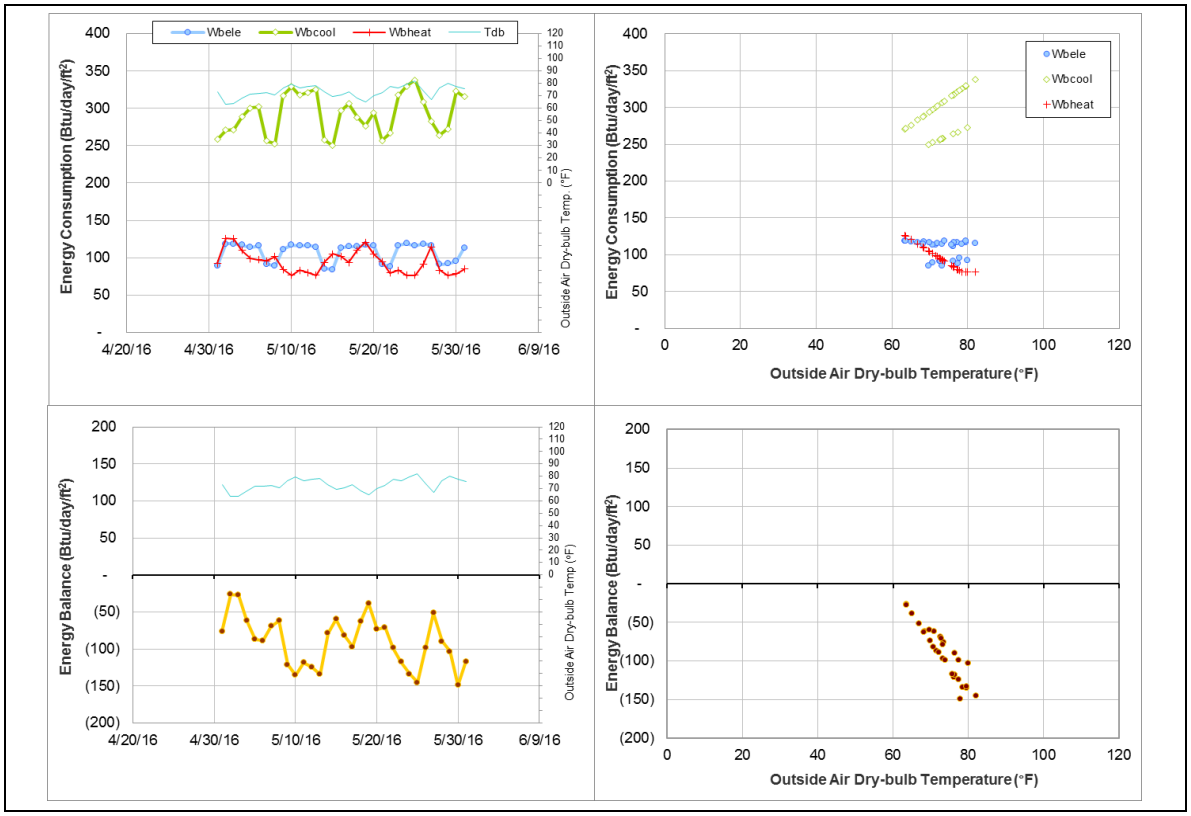
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (HHW meter during August 2015 (top) and May 2016 (bottom))



Energy balance plot using the original data for the month of analysis.



Energy balance plot using the estimated data for the month of analysis



Neeley Residence Hall (TAMU Bldg #652)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
ELE	000056	13	5/19/2016 – 5/31/2016	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE	Decrease in energy consumption	5/19/2016 – ongoing

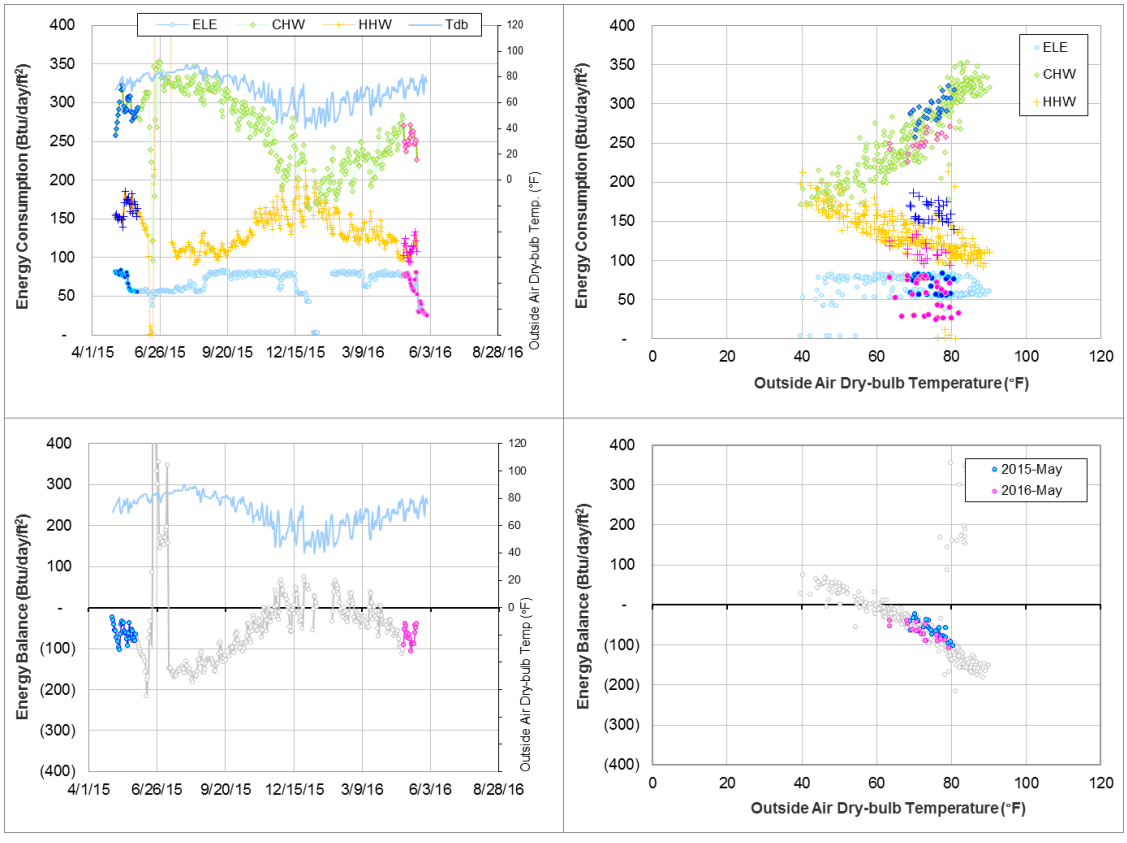
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
ELE	000056	5/19/2016 – ongoing	ELE	Sudden decrease

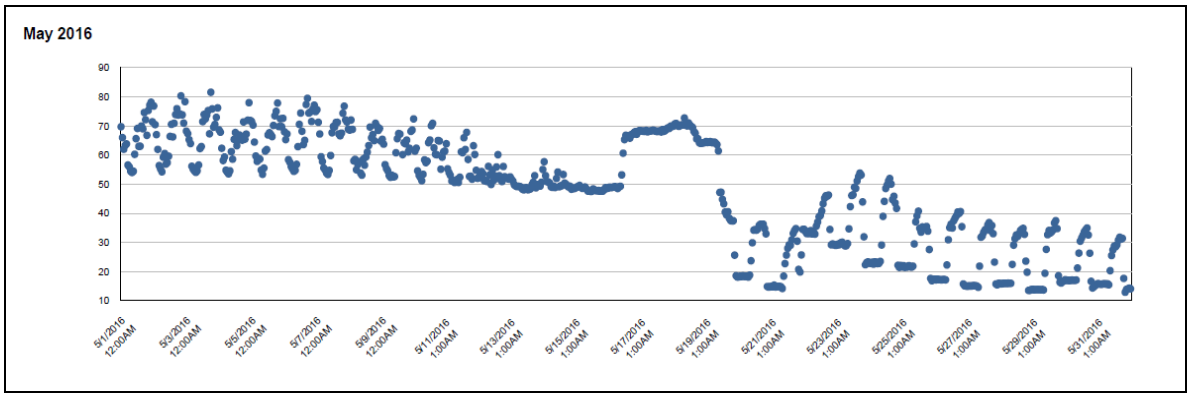
Quantitative descriptions and comments

Starting on 5/19/2016, the ELE consumption droped to an average 642 kWh/day. With the spring semester ending, it is expected to see a drop in consumption; however, about the same time last summer the drop in ELE was only down to an average 1158 kWh/day. Since the ELE consumption for the break period is almost half of that from last summer, these days have been model using the data from last summer.

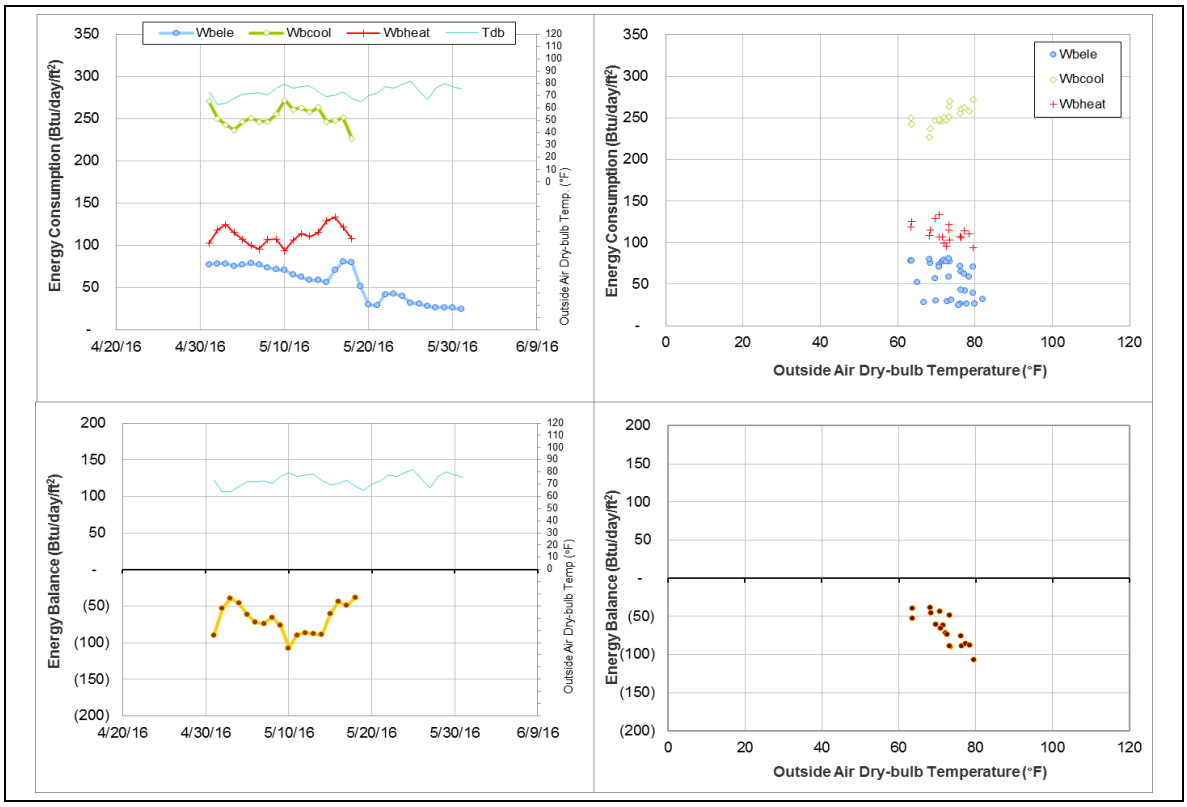
Explanatory Figure: 13 months energy balance plot with original data



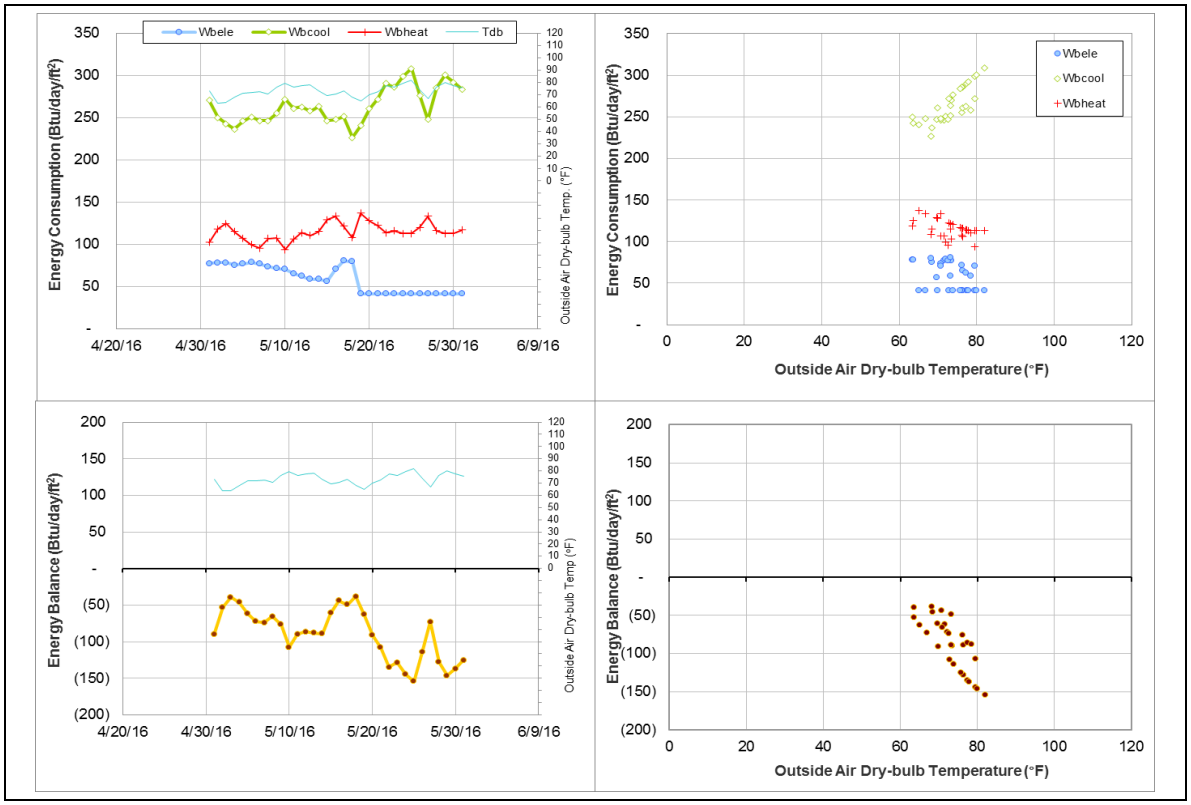
Explanatory Figure: Time series plots of hourly ELE energy consumption from utilities office. (May 2016)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



McNew Laboratory (TAMU Bldg #740)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
HHW	005968	31	5/1/2016 – 5/31/2016	Model
CHW	005974	8	5/9/2016 – 5/10/2016 5/21/2016 5/24/2016 – 5/25/2016 5/28/2016 – 5/29/2016 5/31/2016	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
Energy Balance	The level decreased and the cross-point of temperature is too low.	3/22/2013–ongoing
HHW	The consumption level decreased by 60% or more.	3/22/2013–ongoing
CHW	The consumption level decreased.	5/9/2016 – 5/10/2016 5/21/2016 5/24/2016 – 5/25/2016 5/28/2016 – 5/29/2016 5/31/2016

Changes in sensor readings related to the detected issues

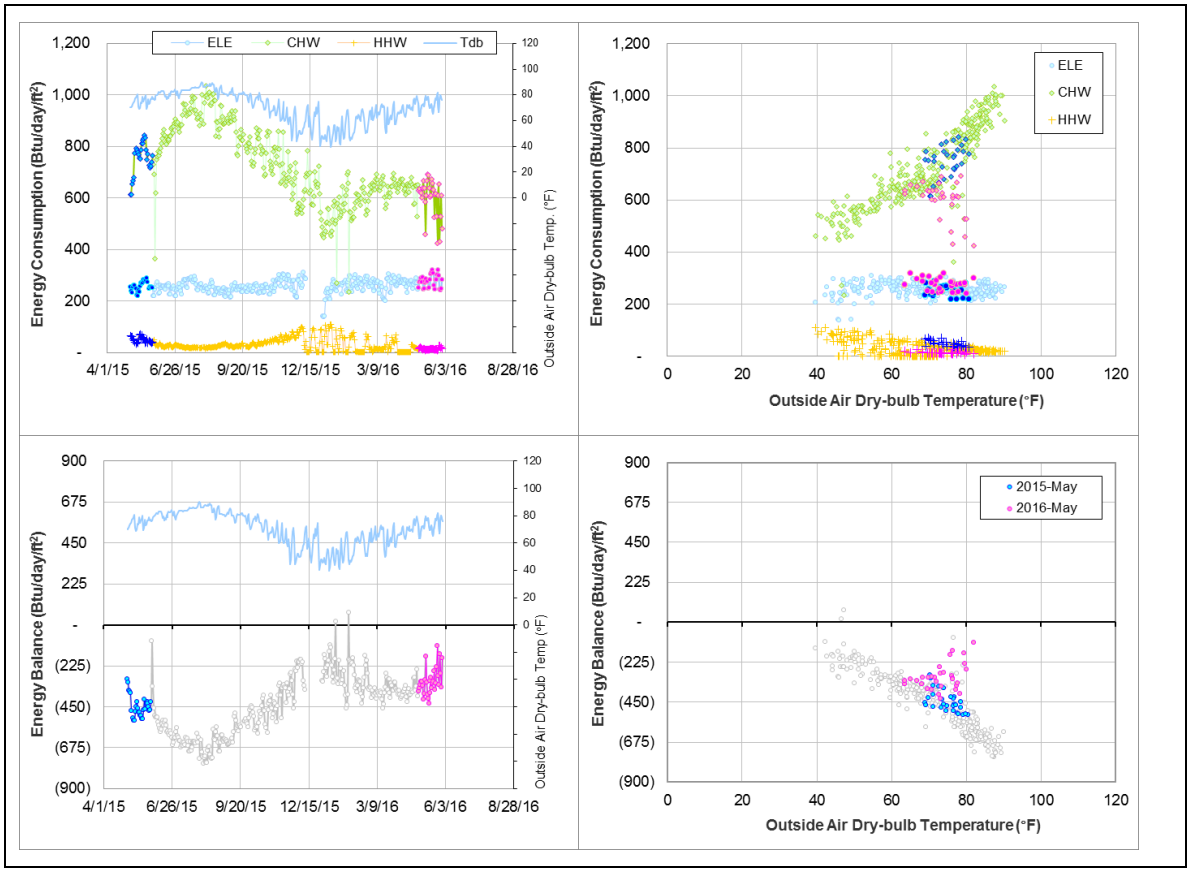
Energy Type	Meter ID	Period	Type	Description
HHW	005968	3/22/2013–1/1/2014	Flow Rate	Decreased largely
		1/1/2014 - ongoing	Delta-T	Small
CHW	005974	5/9/2016 – 5/10/2016 5/21/2016 5/24/2016 – 5/25/2016 5/28/2016 – 5/29/2016 5/31/2016	Flow Rate	Decreased largely
			Delta T	Small

Quantitative descriptions and comments

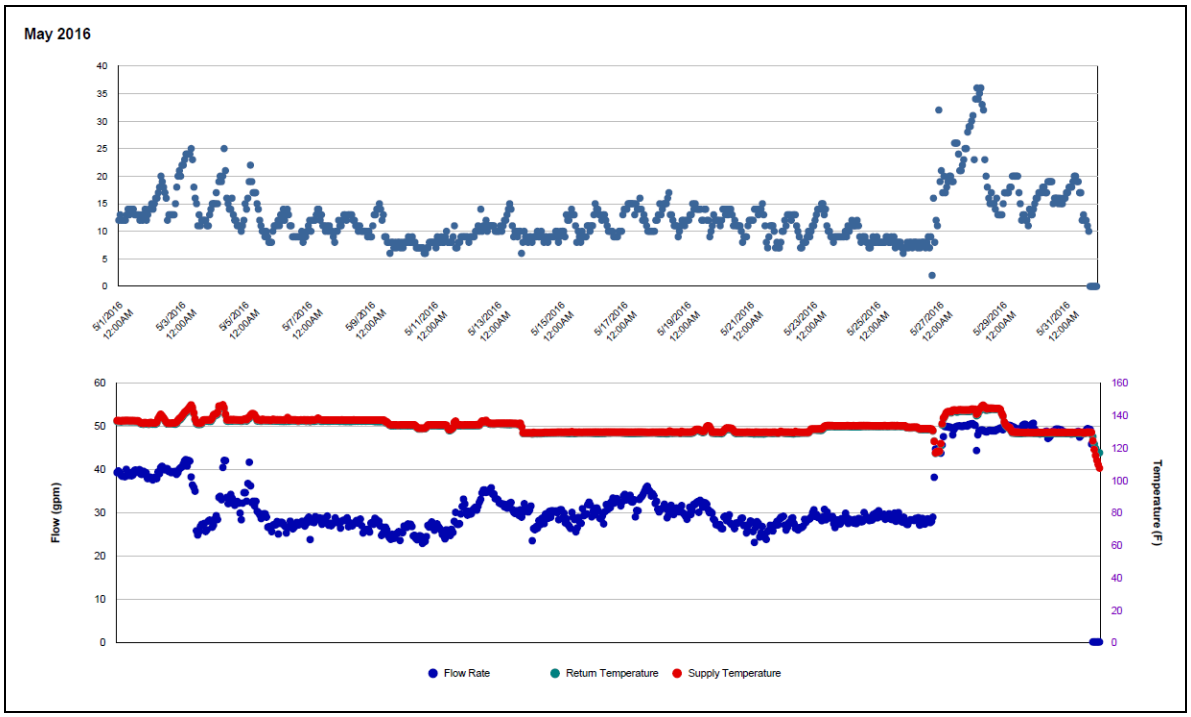
The energy balance level decreased to around 40˚F cross-point temperature after 3/22/2013 due to the decreased of the HHW consumption. The HHW consumption in current month is about 200 Btu/day/ft^2 lower than that before 3/22/2013. The current delta-T for HHW meter is too small. It is suggested to investigate this meter. The HHW was estimated by a model.

CHW showed a couple of days of lower than expected consumption during higher OA temperatures. There appeared to be a decrease in CHW flow and delta T during these days. The CHW for these eight days was estimated by a model.

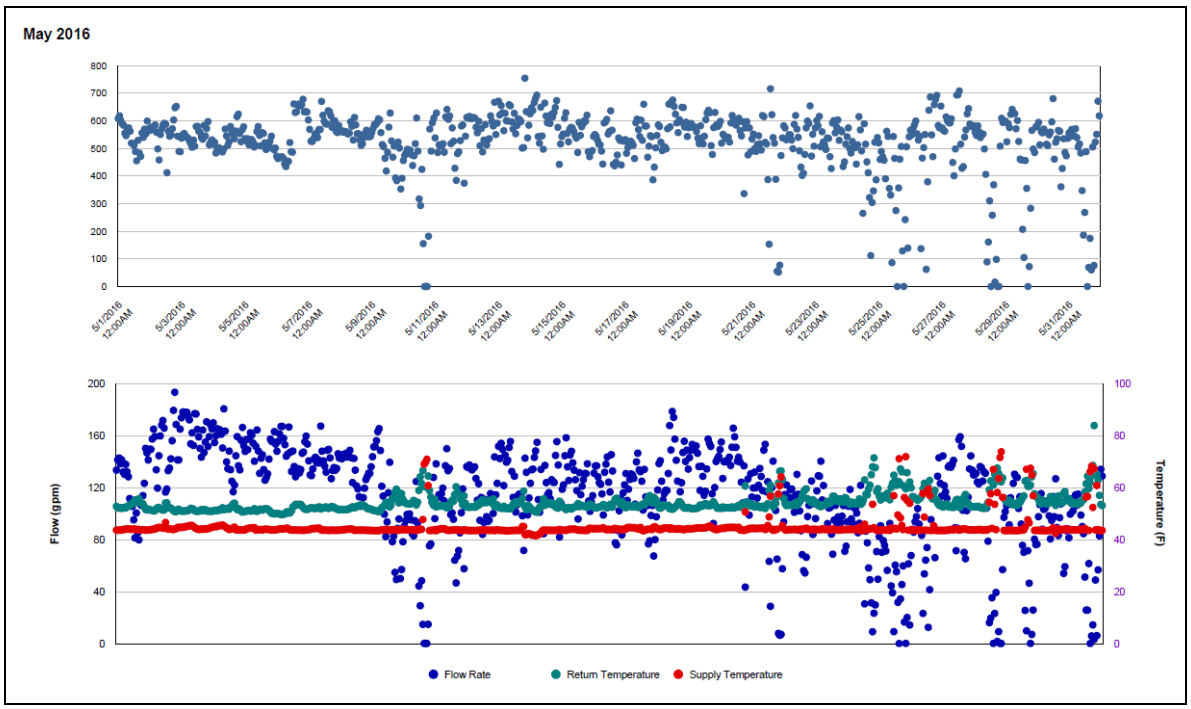
Explanatory Figure: 13 months energy balance plot with original data



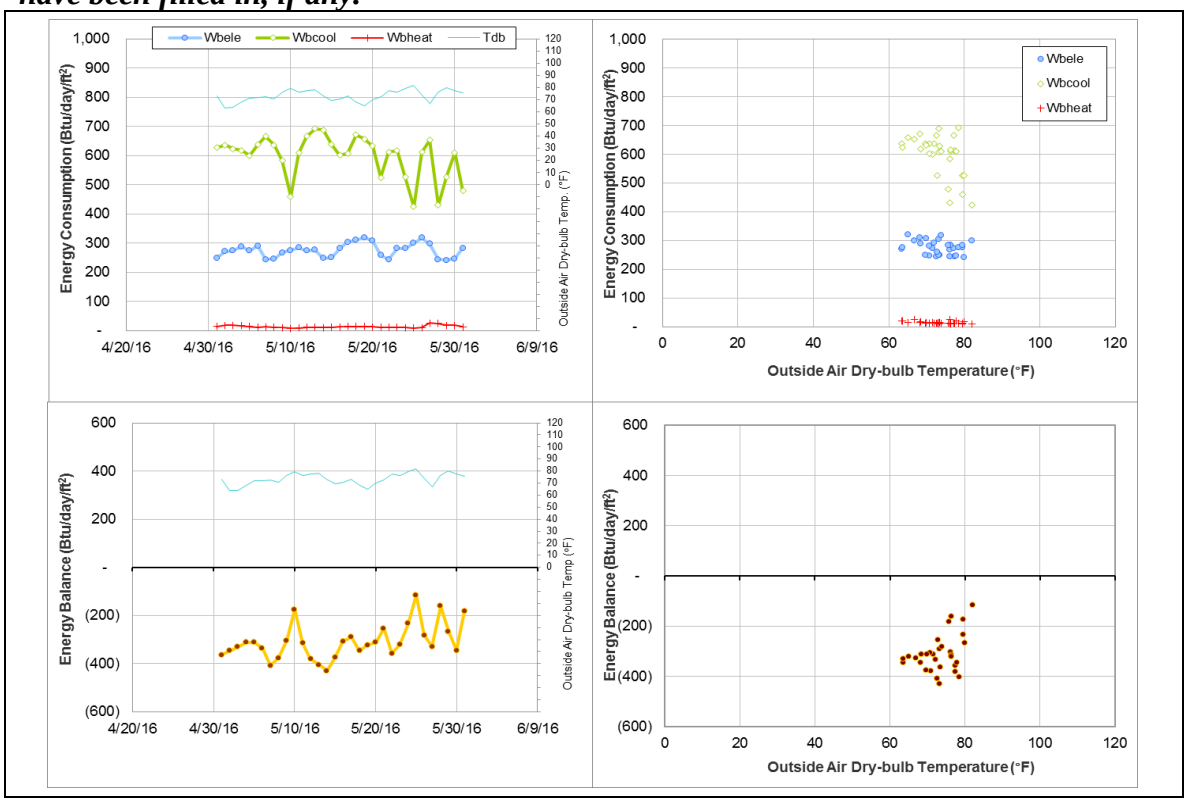
Explanatory Figure: Time series plots of hourly HHW energy consumption, flow rate, and supply and return temperatures from utilities office. (May 2016)



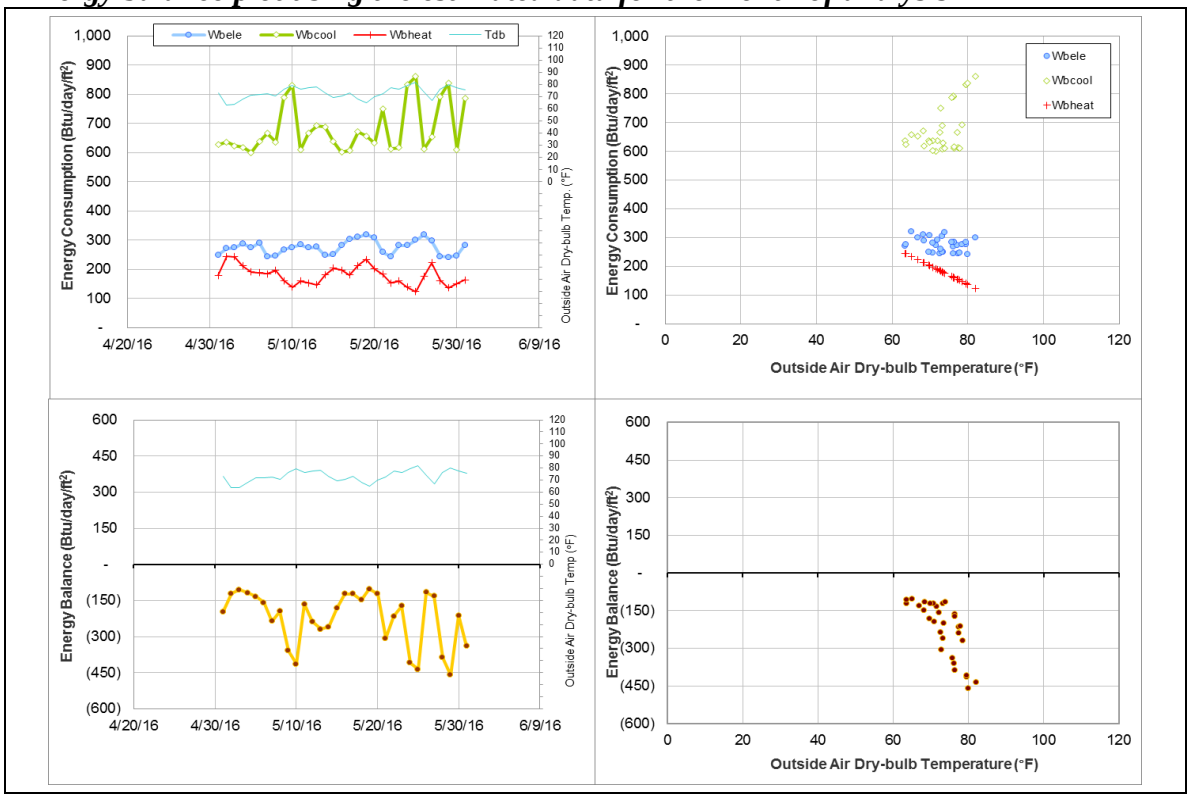
Explanatory Figure: Time series plots of hourly CHW energy consumption, flow rate, and supply and return temperatures from utilities office. (May 2016)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Vivarium III (TAMU Bldg #1020)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
CHW	005997	31	5/1/2016 – 5/31/2016	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption level increased.	1/14/2016 – ongoing

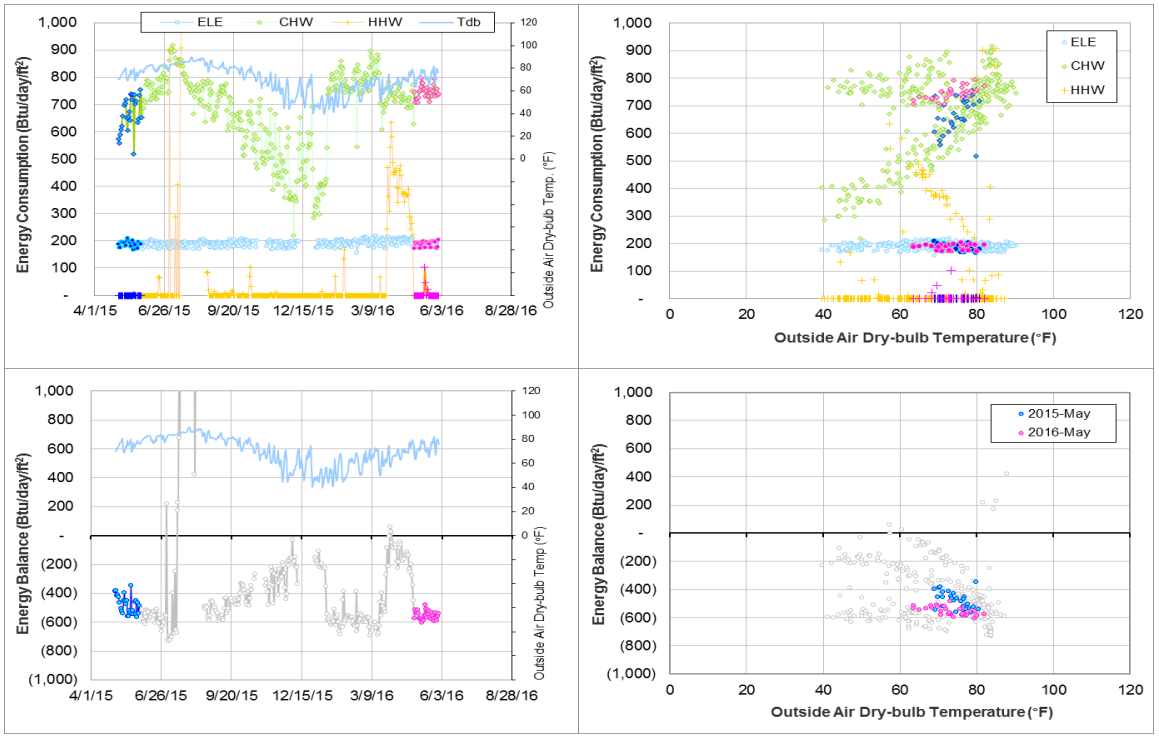
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
CHW	006001	1/14/2016 – ongoing	Return Temperature	Increased

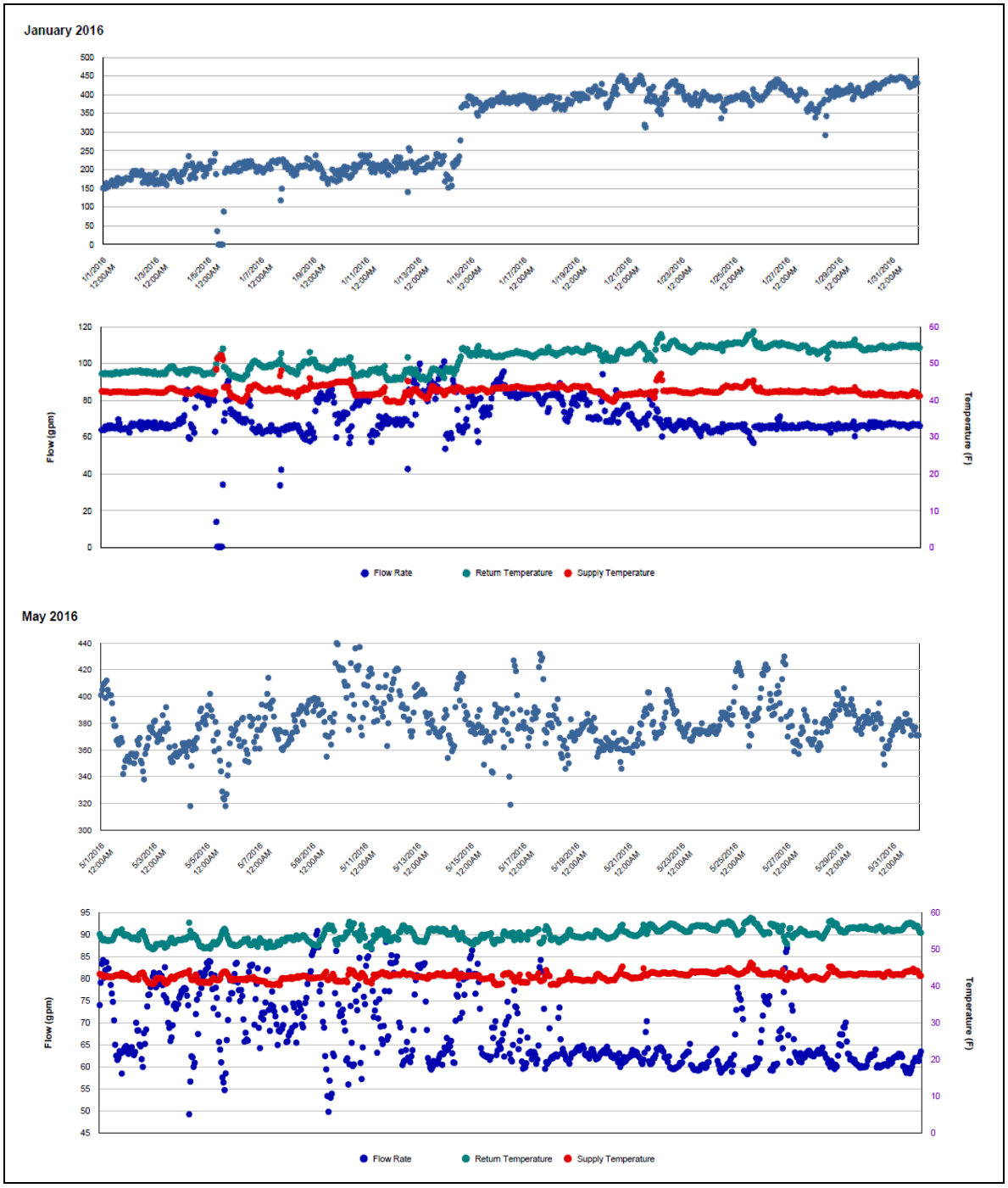
Quantitative descriptions and comments

CHW consumption increased by approximately 100% since 1/14/2016 due to a sudden increase of return temperature. The return temperature increased from ~48˚F to ~55˚F. The consumption for entire month was estimated by a model.

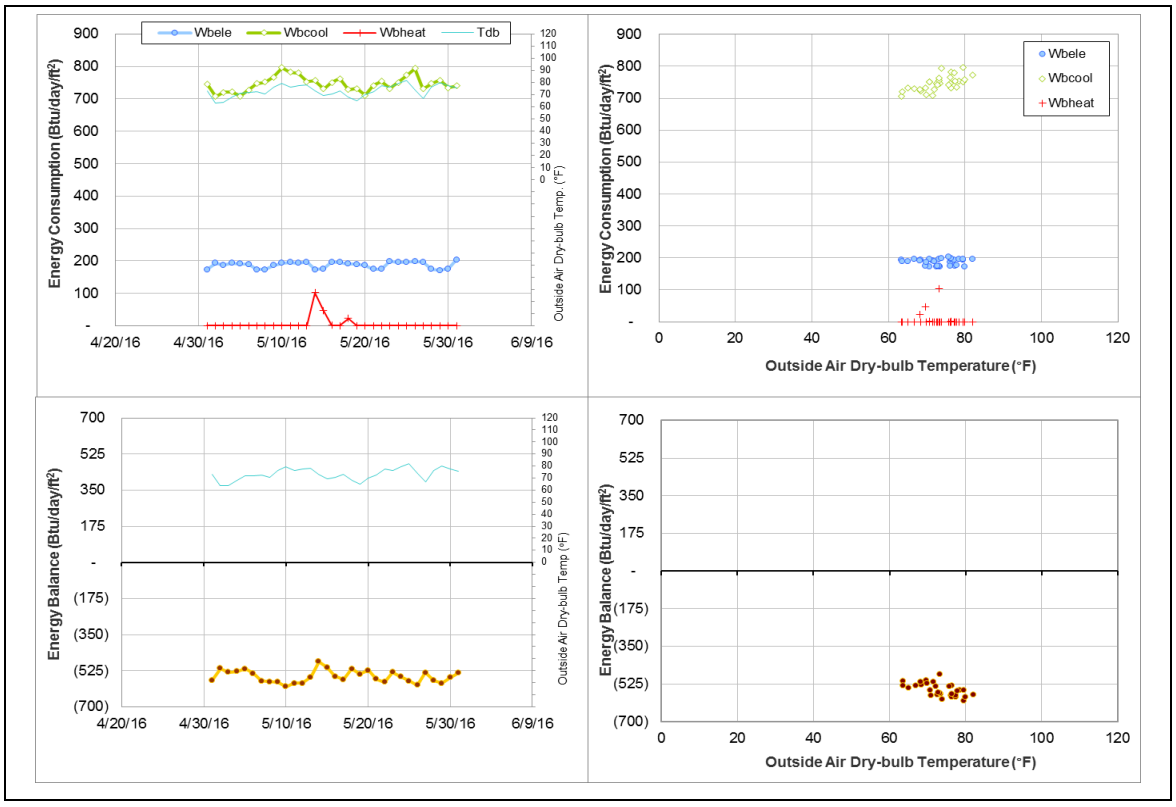
Explanatory Figure: 13 months energy balance plot with original data (problematic HHW data during7/16/2015 – 8/16/2015 has not been removed from the plot.)



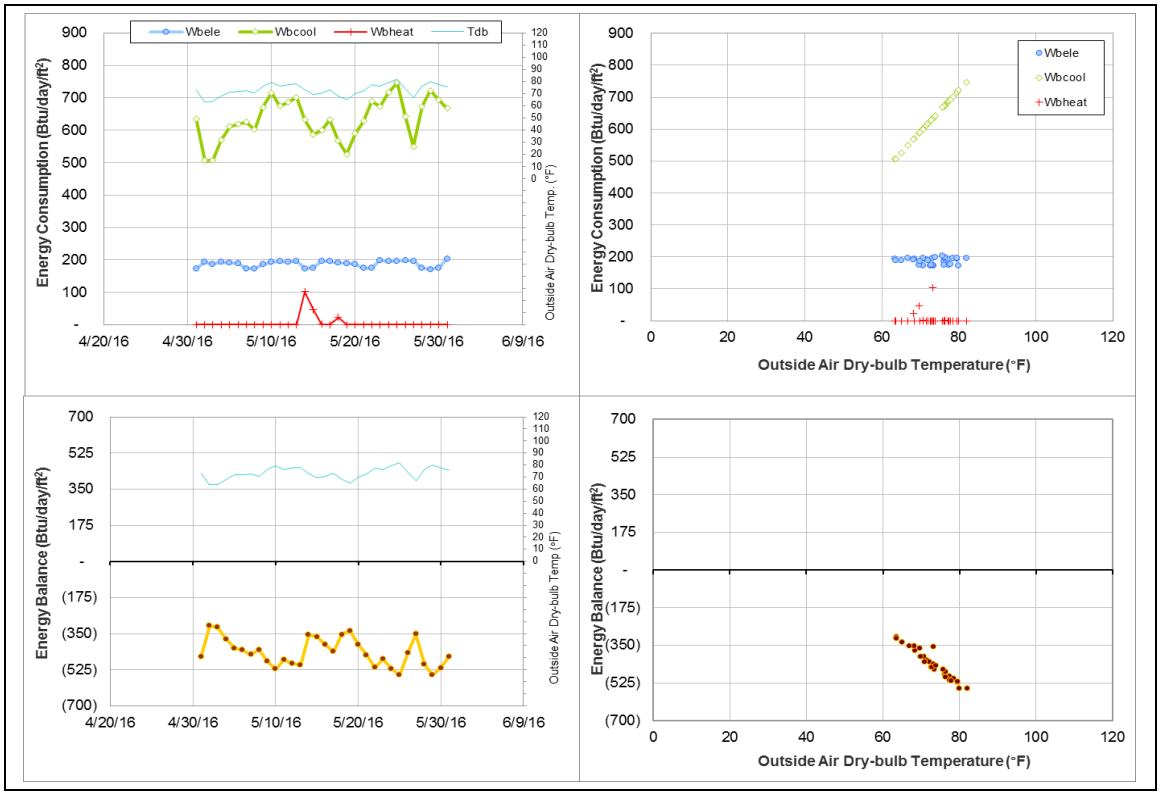
Explanatory Figure: Time series plots of hourly CHW energy consumption, flow rate, and supply and return temperatures from the utilities office. CHW meter for January 2016 (top) and May 2016 (bottom).



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Veterinary Anatomic Pathology (TAMU Bldg #1184)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
HHW	006999	6	5/14/2016 5/21/2016 5/28/2016 – 5/31/2016	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	The consumption level increased for a short period.	5/14/2016 5/21/2016 5/28/2016 – 5/31/2016

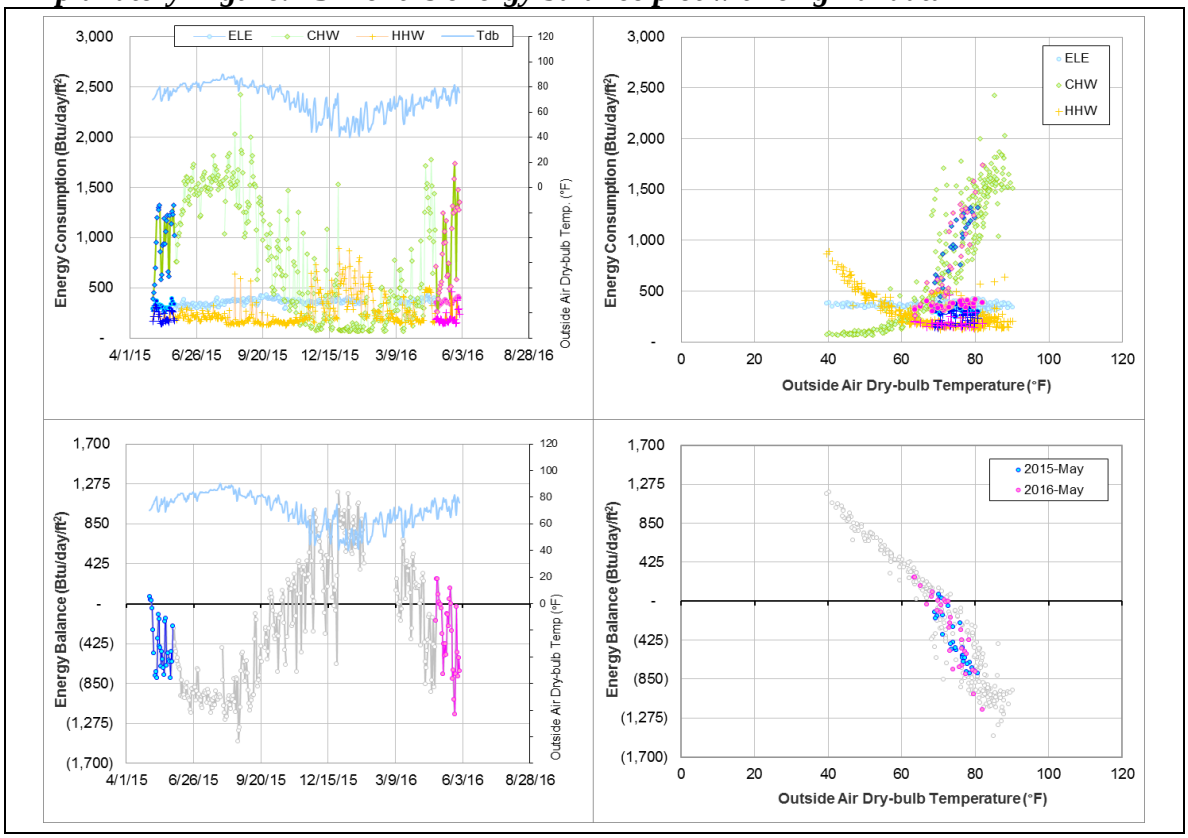
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
HHW	006999	5/14/2016 5/21/2016 5/28/2016 – 5/31/2016	Flow	period of high flow

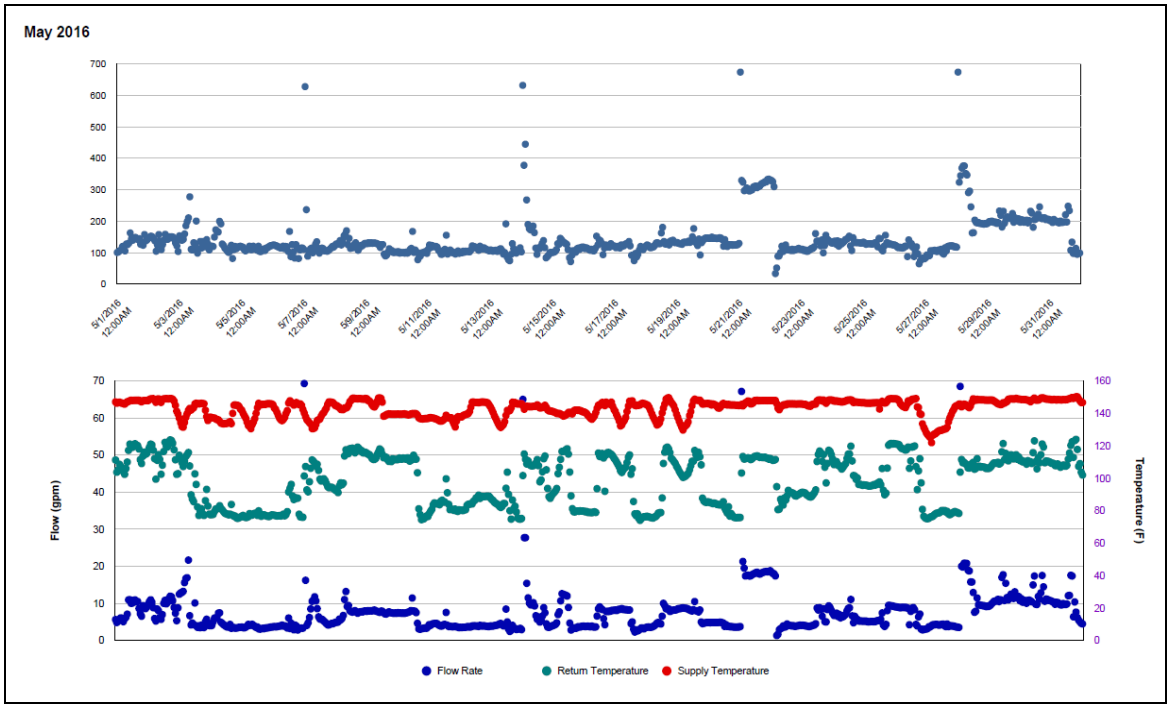
Quantitative descriptions and comments

HHW showed a period of high flow for 5/14/2016, 5/21/2016, and 5/28/2016 – 5/31/2016. The consumption during this period was estimated by models.

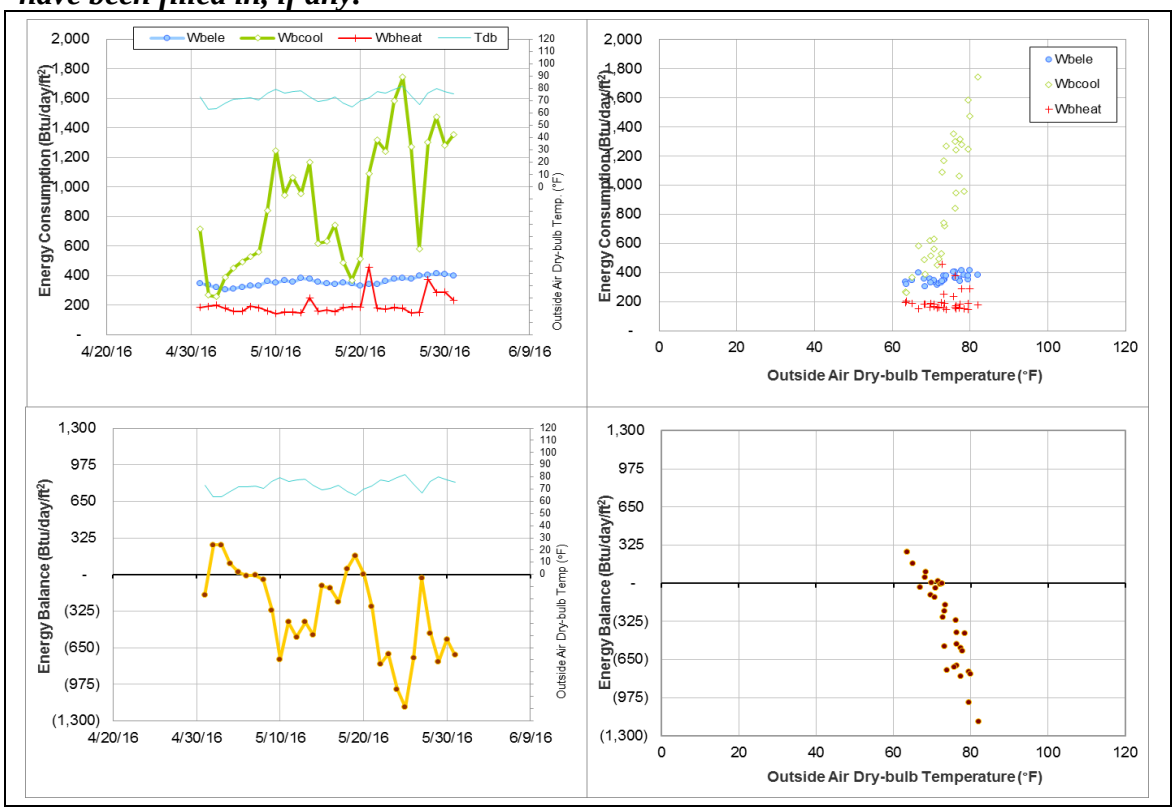
Explanatory Figure: 13 months energy balance plot with original data



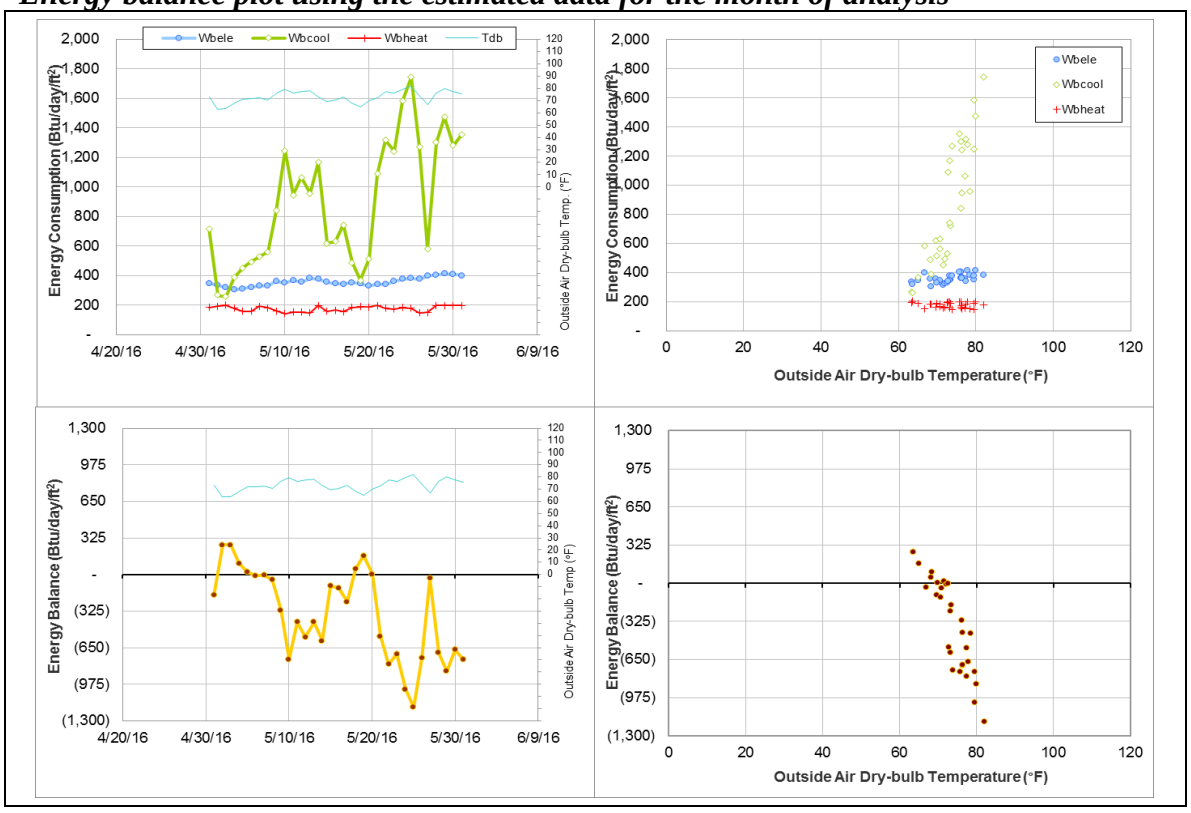
Explanatory Figure: Time series plots of hourly HHW energy consumption, flow rate, and supply and return temperatures from the utilities office. (May 2016)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Heep Center (TAMU Bldg #1502)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
HHW	002603	6	5/12/2016-5/17/2016	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	The consumption dropped for a short period.	5/12/2016-5/17/2016

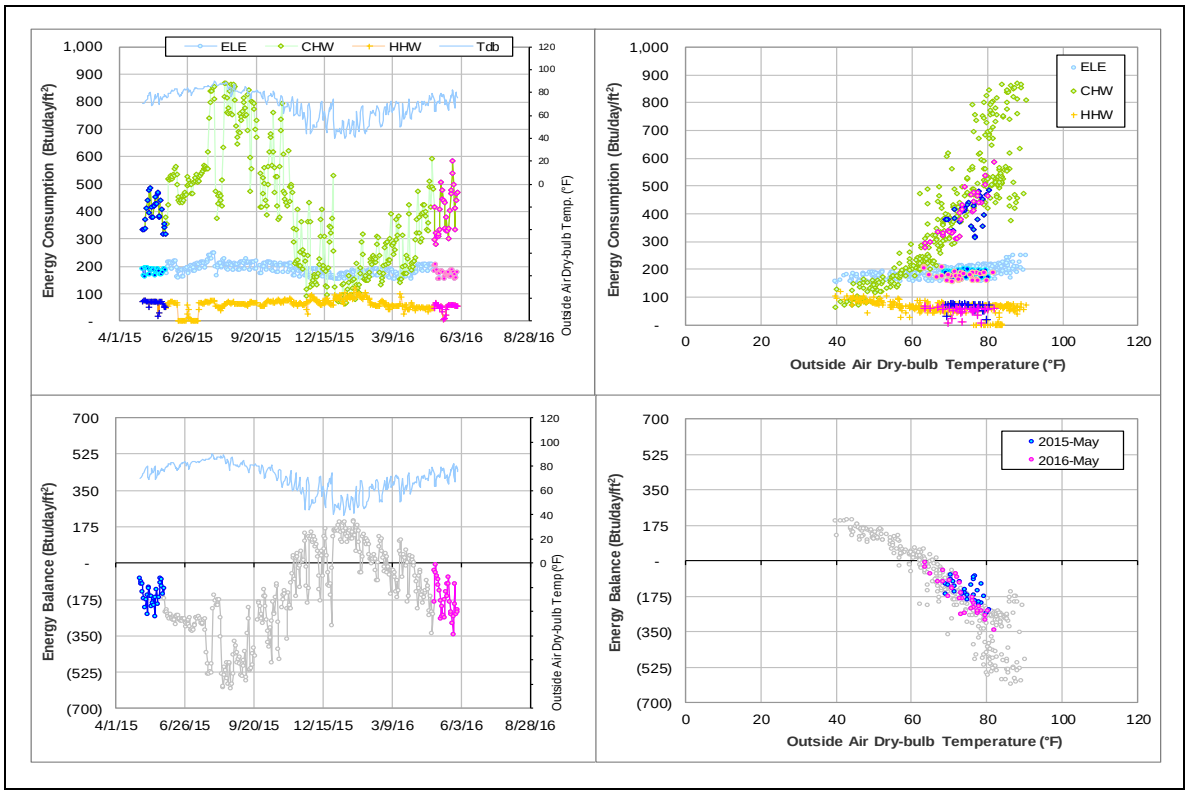
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
HHW	002603	5/12/2016-5/17/2016	Return temperature	Increased

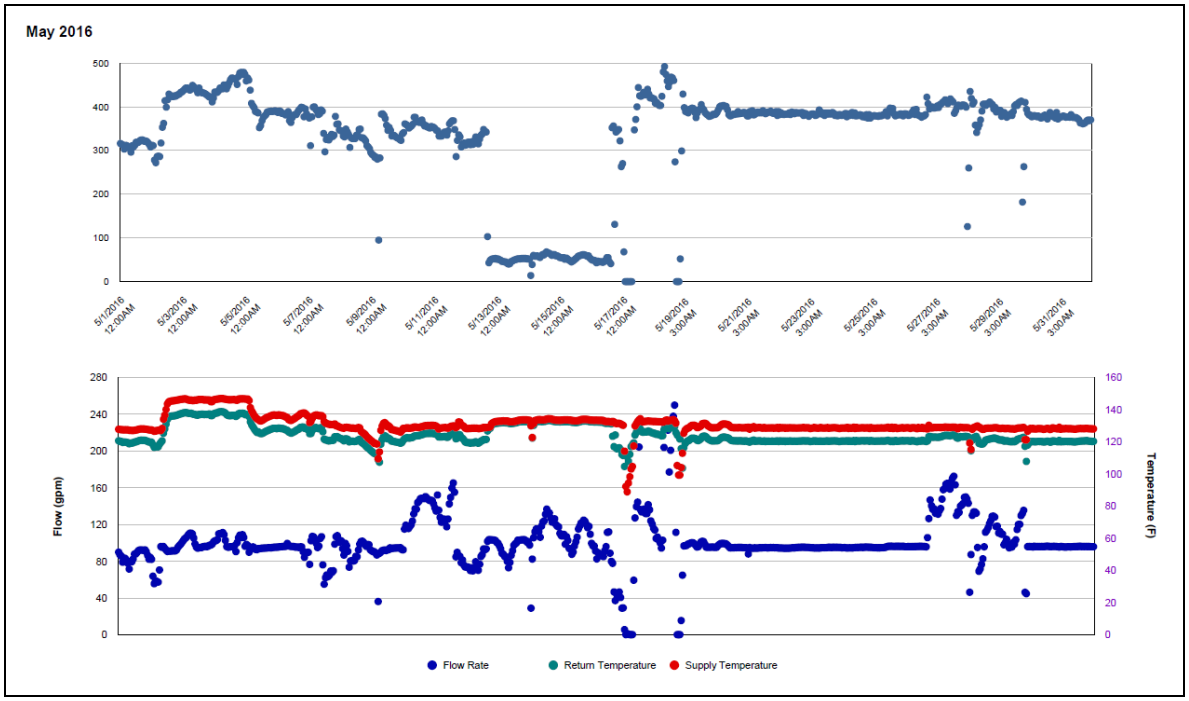
Quantitative descriptions and comments

The HHW consumption dropped for a short period during 5/12/2016-5/17/2016. The return temperature suddenly increased without the big change for supply temperature and flow rate. The consumption was estimated by a model.

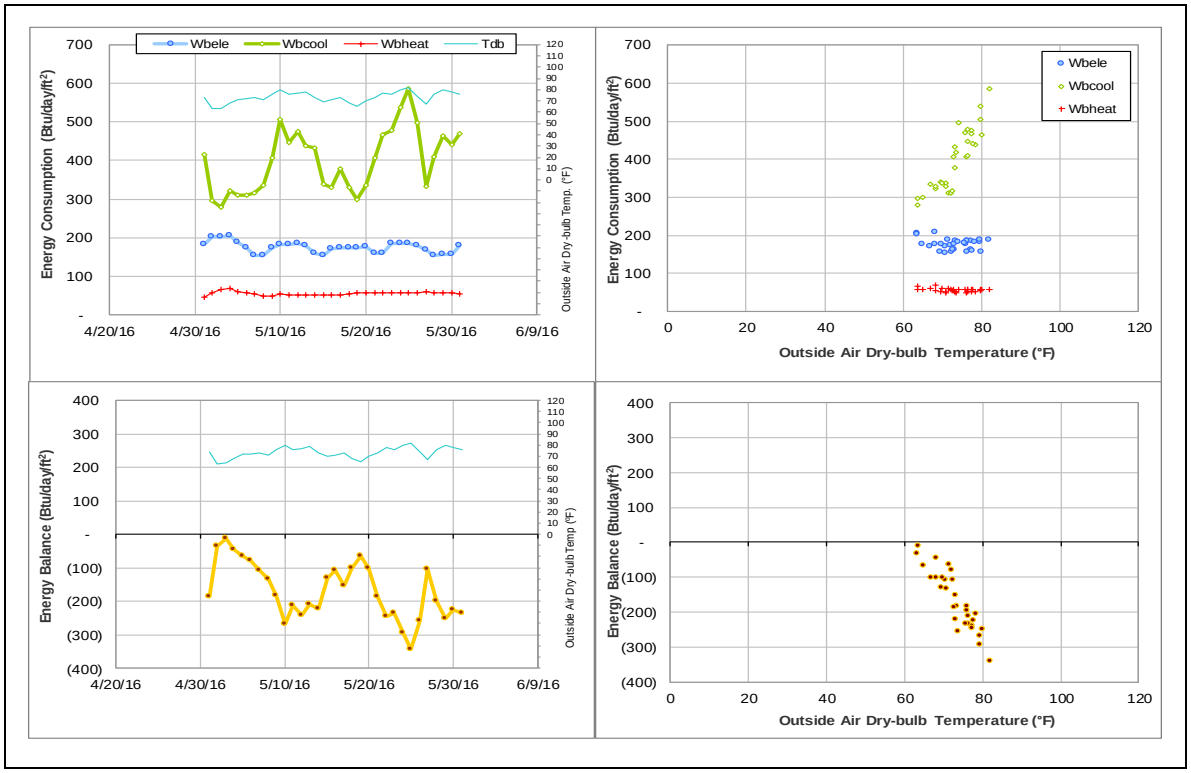
Explanatory Figure: 13 months energy balance plot with original data



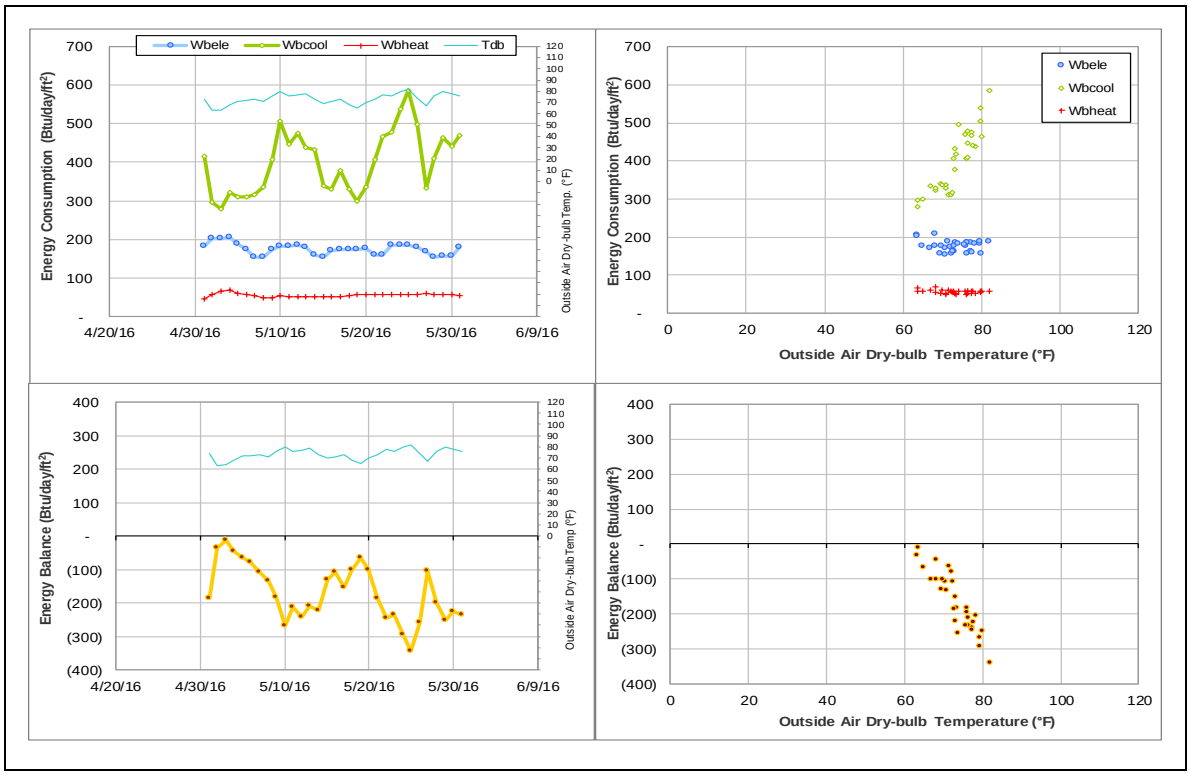
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (HHW meter for May 2016)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Reynolds Medical Sciences Building (TAMU Bldg #1504)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
HHW	003993	3	5/25/2016-5/27/2016	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	The consumption dropped for a short period.	5/25/2016-5/27/2016

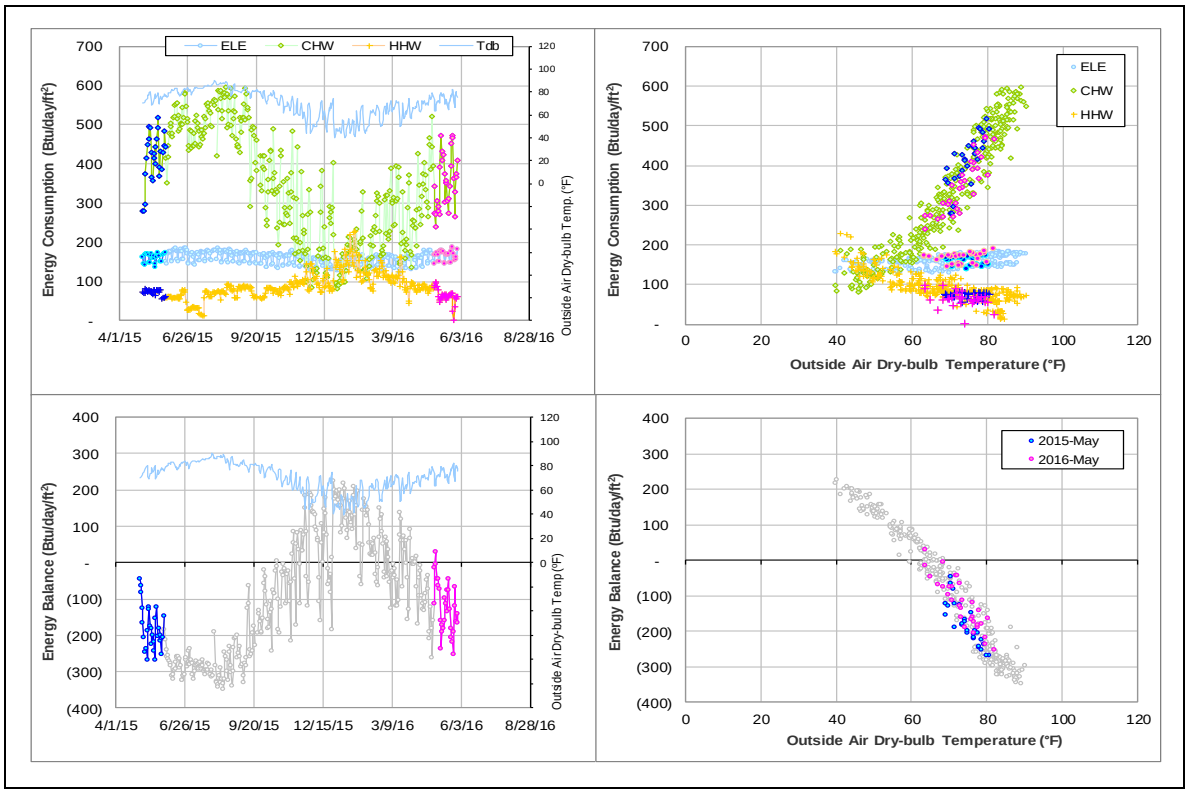
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
HHW	003993	5/25/2016-5/27/2016	Flow rate	Decreased

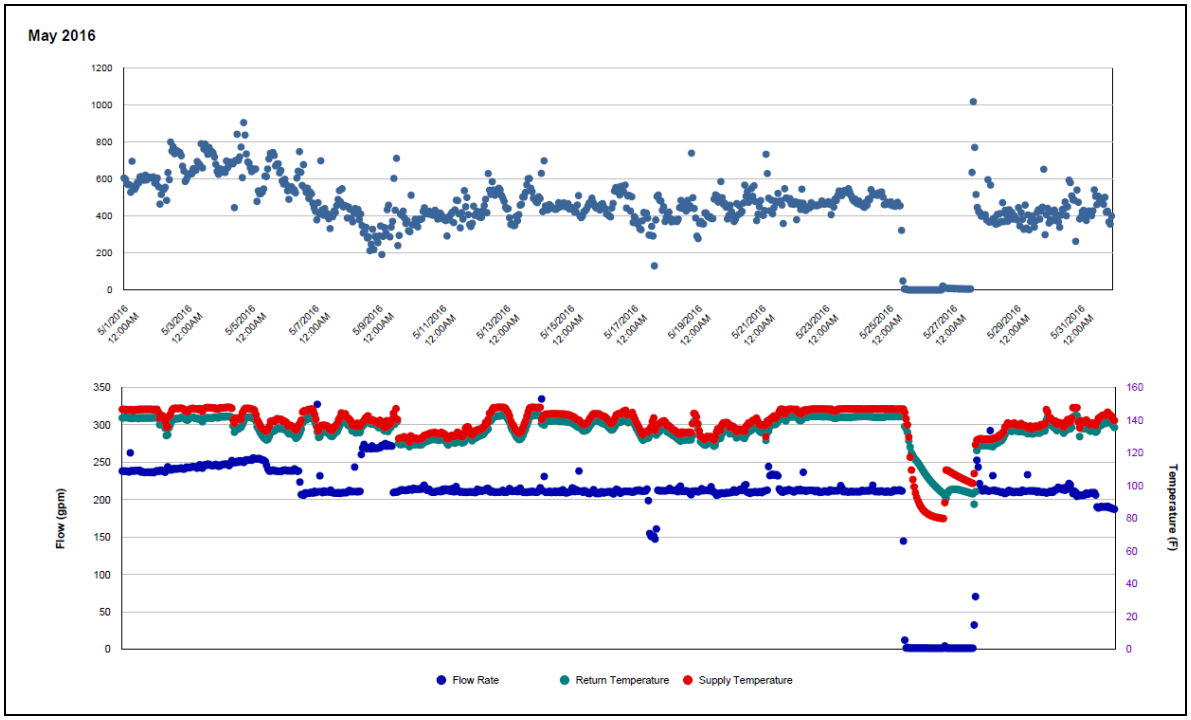
Quantitative descriptions and comments

The HHW consumption dropped for a short period during 5/25/2016-5/27/2016 caused by a decrease in the flow rate. The consumption was estimated by a model.

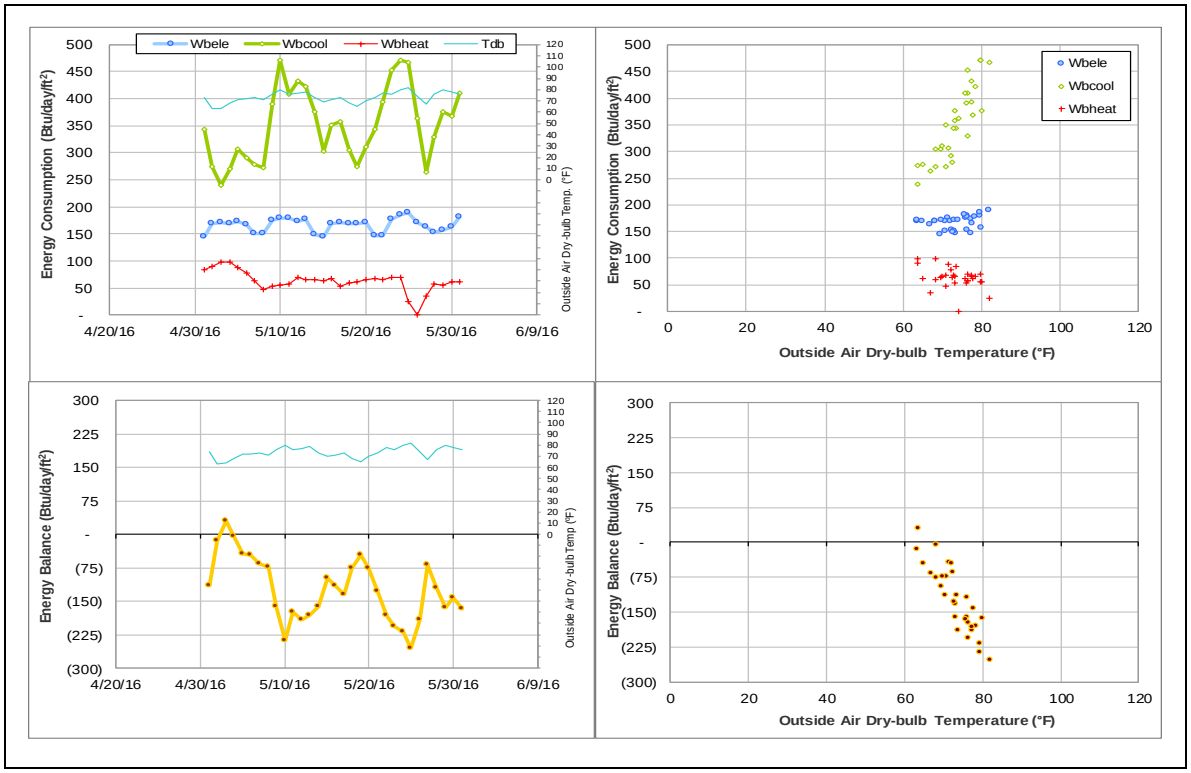
Explanatory Figure: 13 months energy balance plot with original data



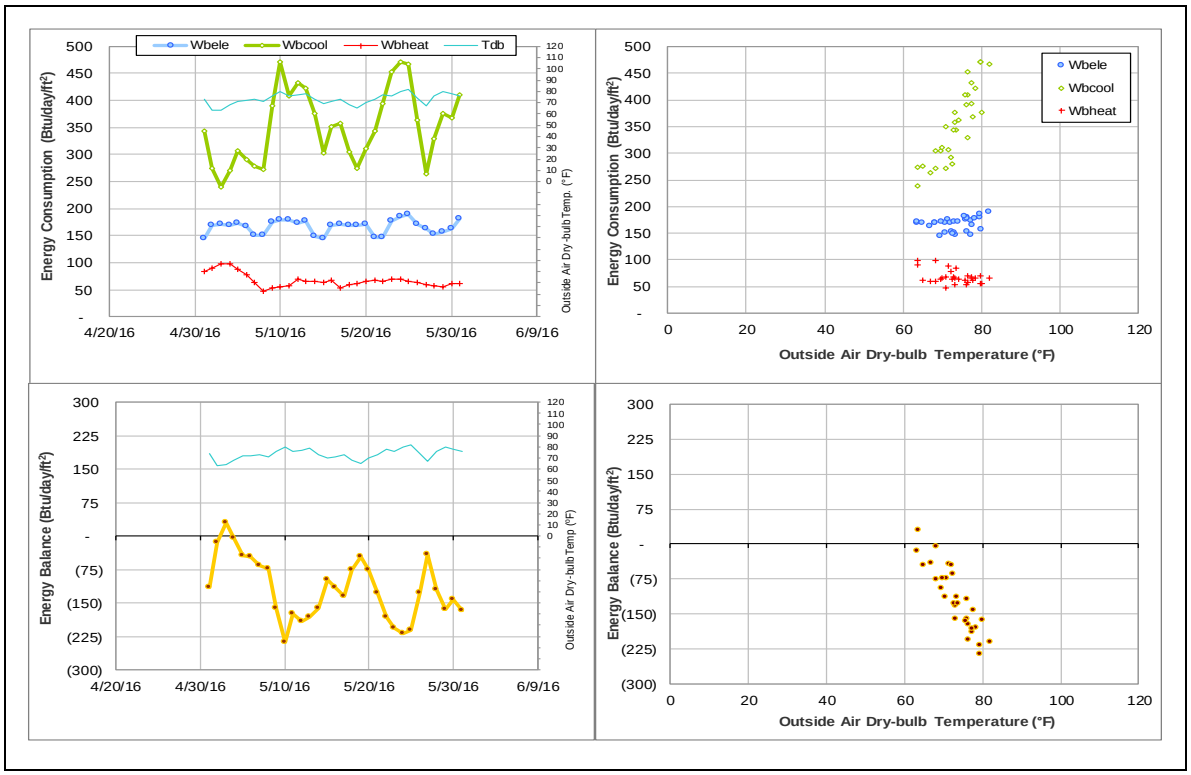
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (HHW meter for May 2016)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Price Hobgood Ag. Engineering Research Lab (TAMU Bldg #1508)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
CHW	006005	4	5/1/2016-5/4/2016	Model
HHW	006009	2	5/2/2016-5/3/2016	Model

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption level is lower than the level during the past year.	December 2015-5/4/2016
HHW	The consumption increased for a short period.	5/2/2016-5/3/2016

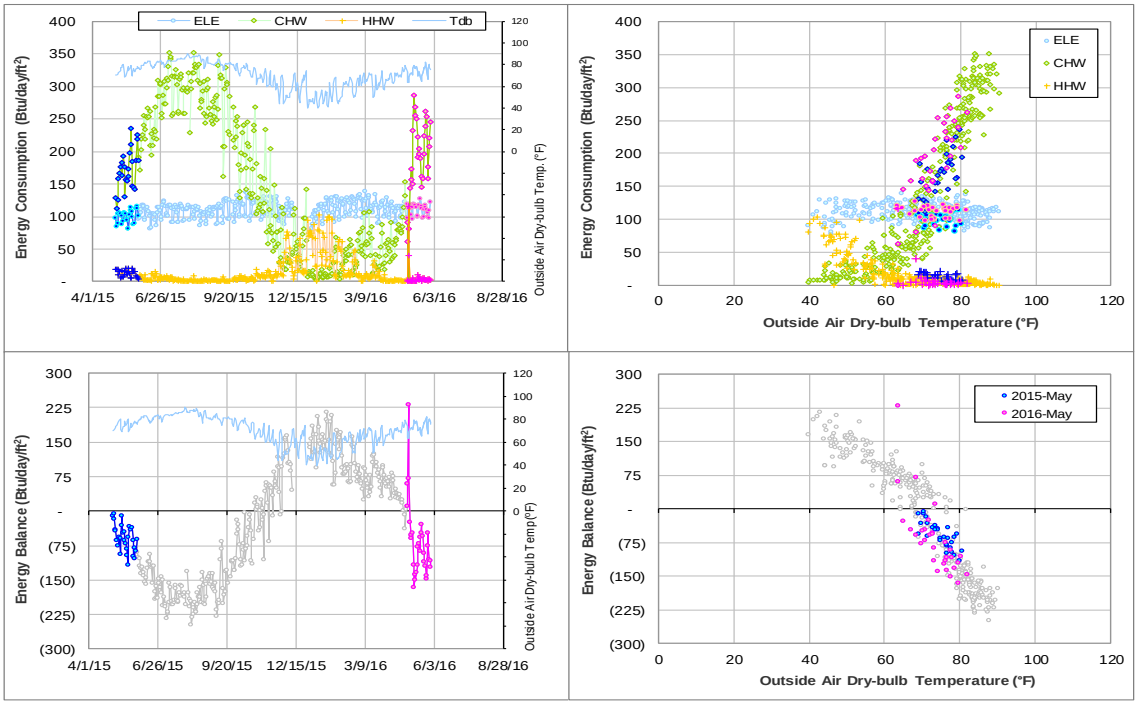
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
CHW	006005	December 2015-5/2/2016	Flow rate	Decreased
		5/3/2016-5/4/2016	Flow rate	Zero
HHW	006009	5/3/2016-5/4/2016	Flow rate	Increased

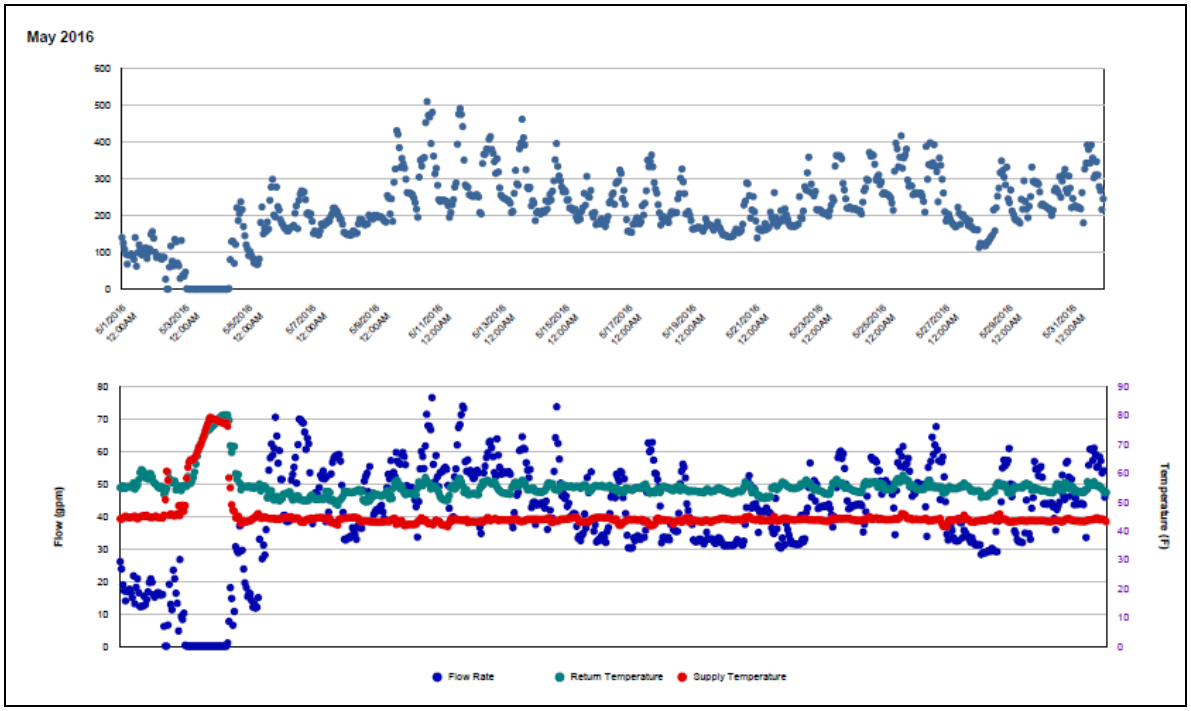
Quantitative descriptions and comments

The CHW consumption was about 50 Btu/day/ft^2 lower than the level during the past year since December 2015. The consumption level increased back after 5/4/2016 due to an increase of flow rate. The HHW consumption increased for a short period during 5/3/2016-5/4/2016 caused by a sudden increase of flow rate. The consumption was estimated by models.

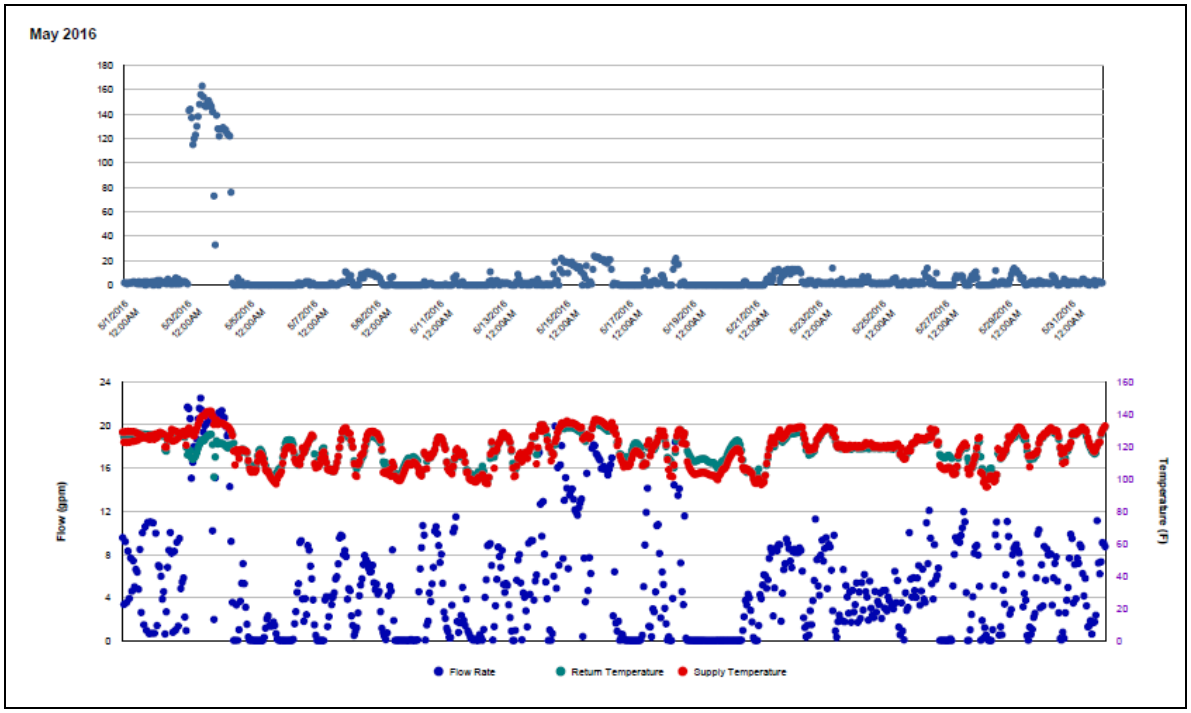
Explanatory Figure: 13 months energy balance plot with original data



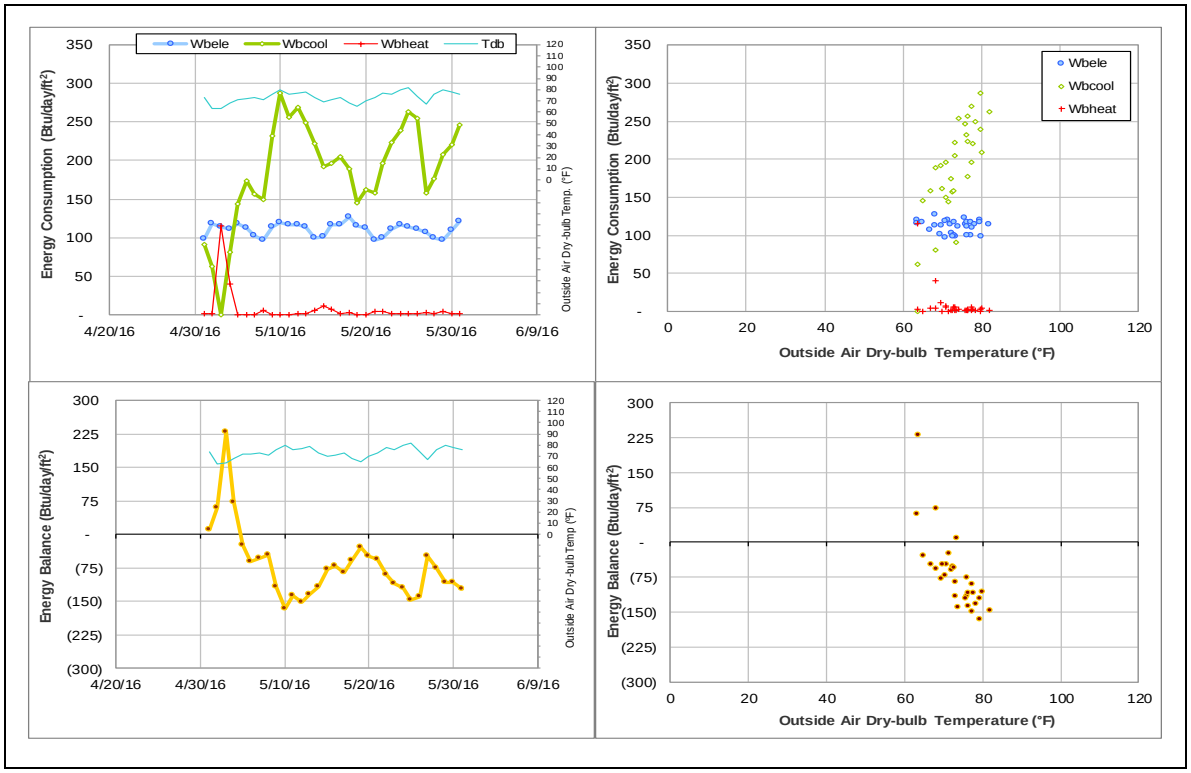
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (CHW meter for May 2016)



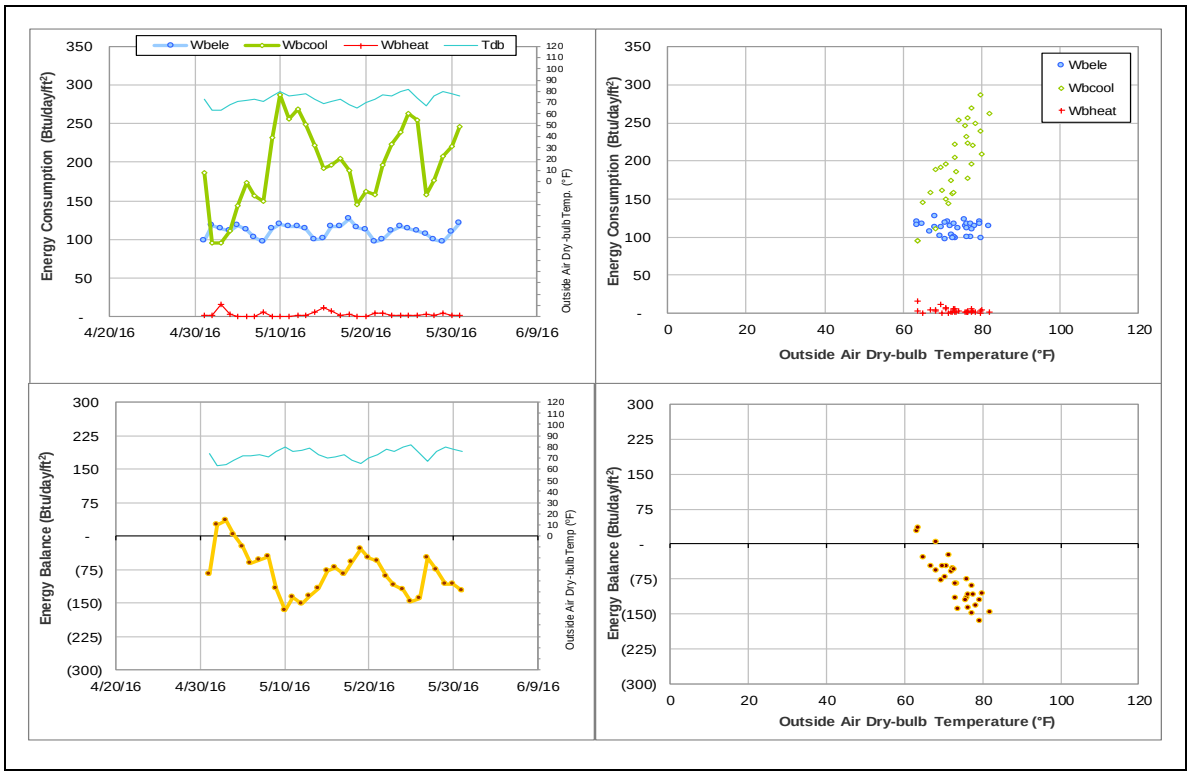
Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (HHW meter for May 2016)



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Southern Crop Improvement Greenhouse (TAMU Bldg #1512)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
ELE	005931	31	5/1/2016 – 5/31/2016	Model

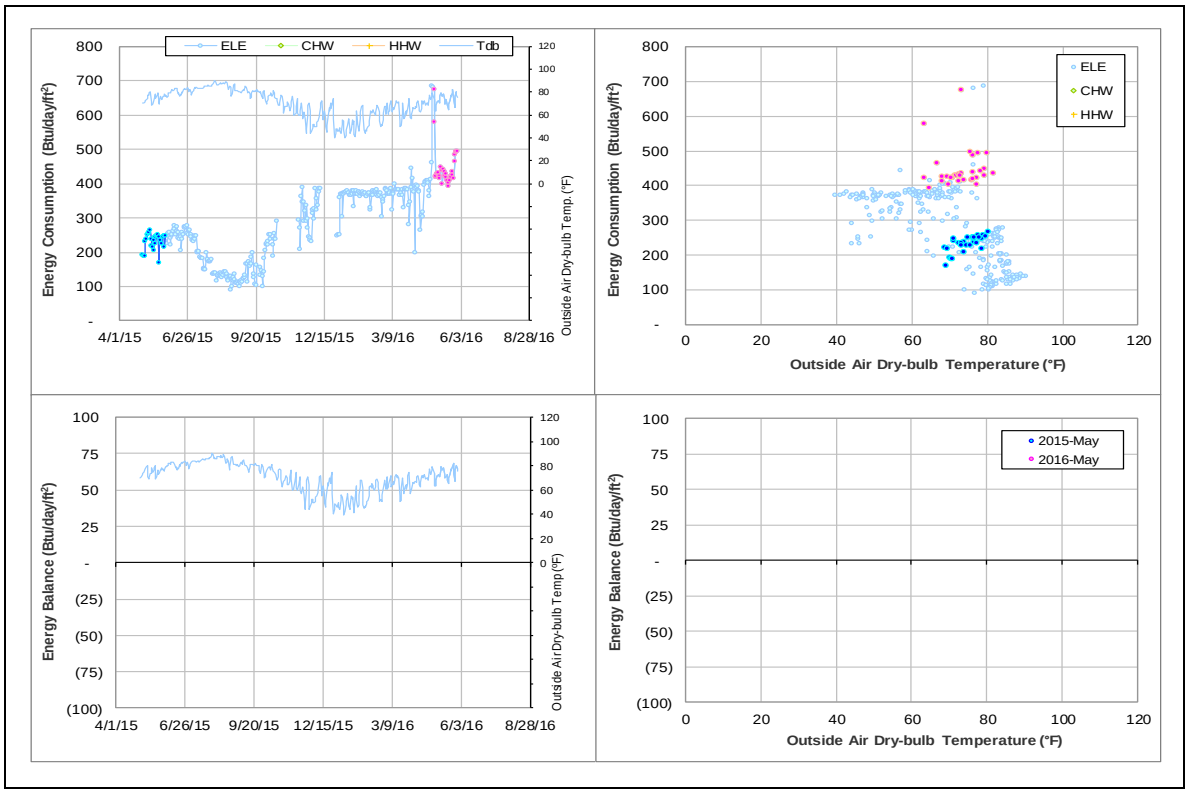
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE	The consumption decreased.	7/22/2015 – 10/3/2015
	The consumption increased.	11/13/2015 – ongoing

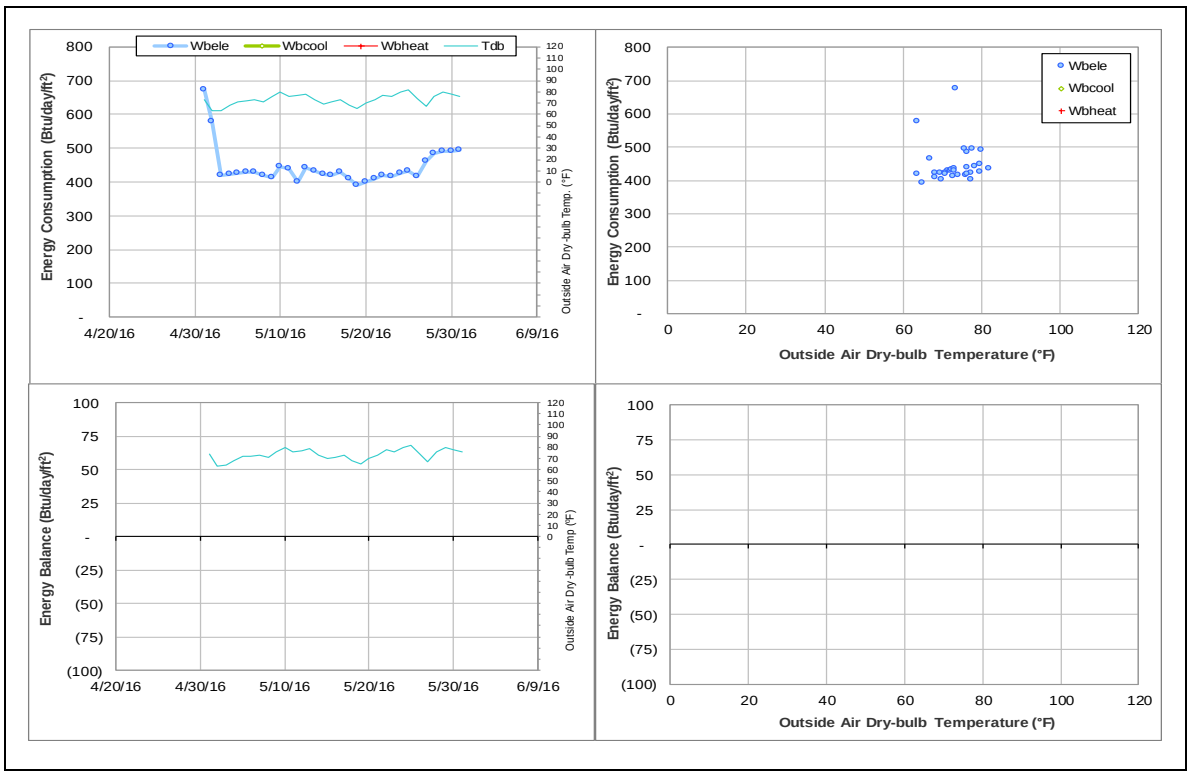
Quantitative descriptions and comments

The electricity consumption gradually decreased by approximately 120 Btu/day/ft^2 (~50%) since July 2015. It seemed that the building peak demand decreased during this period. The consumption level increased back after 10/3/2015. But it increased largely (50 – 200 Btu/day/ft^2) after 11/13/2015 and further increased (300 Btu/day/ft^2) after 4/29/2016. The consumption for entire month was estimated by a model based on the data during 7/1/2014 – 6/30/2015.

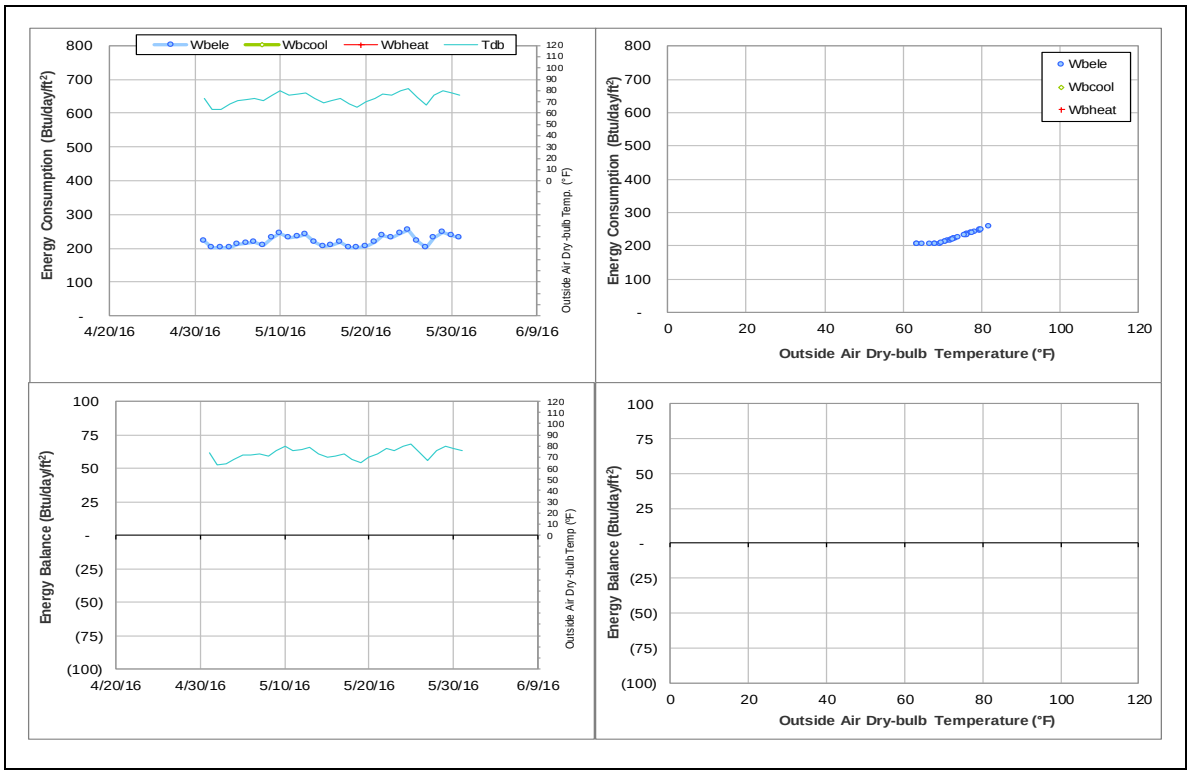
Explanatory Figure: 13 months energy balance plot with original data



Energy balance plot using the original data for the month of analysis.



Energy balance plot using the estimated data for the month of analysis



TX School of Rural Public Health (TAMU Bldg # 1518, 1519, 1520)

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE (005274)	The consumption level increased largely.	8/14/2015 - ongoing
ELE (005275)	The consumption level decreased largely.	8/14/2015 - ongoing

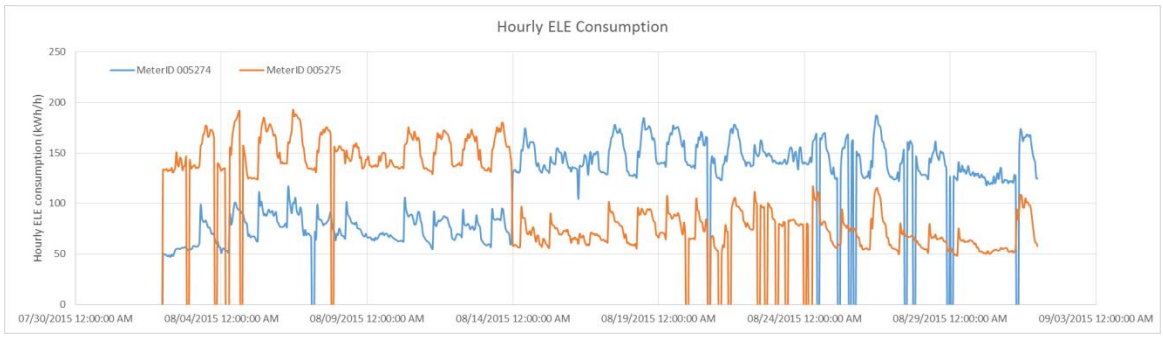
Comments

ELE meter (ID# 005274) is serve for TX School of Rural Public Health B and ELE meter (ID# 005275) is for TX School of Rural Public Health C.

The ELE consumption levels for these two meters have a sudden change on 8/14/2015. The consumption level for meterID 005274 increased by approximate 80 kWh/h (~ 100%) and the consumption level for meter ID 005275 decreased by around 80 kWh/h (~50%).

It was observed that the cumulative reading for these two meters switched on 8/14/2015 12:00 AM. It is suggested to investigate these two meters.

Explanatory Figure: The time series plot of hourly electricity consumption for two ELE meters #005274 and# 005275



Explanatory Figure: The time series plot of hourly electricity consumption for two ELE meters #005274 and# 005275

Time	Cumulative reading	Hourly Consumption	MeterID		Time	Cumulative reading	Hourly Consumption	MeterID
08/13/2015 12:00:00 PM	2930884.013	84.262	005274		08/13/2015 12:00:00 PM	4741958.002	170.658	005275
08/13/2015 01:00:00 PM	2930968.589	84.576	005274		08/13/2015 01:00:00 PM	4742132.336	174.334	005275
08/13/2015 02:00:00 PM	2931051.959	83.37	005274		08/13/2015 02:00:00 PM	4742303.554	171.218	005275
08/13/2015 03:00:00 PM	2931146.799	94.84	005274		08/13/2015 03:00:00 PM	4742483.683	180.129	005275
08/13/2015 04:00:00 PM	2931240.505	93.706	005274		08/13/2015 04:00:00 PM	4742662.753	179.07	005275
08/13/2015 05:00:00 PM	2931324.169	83.664	005274		08/13/2015 05:00:00 PM	4742832.009	169.256	005275
08/13/2015 06:00:00 PM	2931399.91	75.741	005274		08/13/2015 06:00:00 PM	4742993.53	161.521	005275
08/13/2015 07:00:00 PM	2931472.181	72.271	005274		08/13/2015 07:00:00 PM	4743149.675	156.145	005275
08/13/2015 08:00:00 PM	2931543.838	71.657	005274		08/13/2015 08:00:00 PM	4743305.9	156.225	005275
08/13/2015 09:00:00 PM	2931613.306	69.468	005274		08/13/2015 09:00:00 PM	4743462.097	156.197	005275
08/13/2015 10:00:00 PM	2931672.706	59.4	005274		08/13/2015 10:00:00 PM	4743610.221	148.124	005275
08/13/2015 11:00:00 PM	2931733.072	60.366	005274		08/13/2015 11:00:00 PM	4743745.645	135.424	005275
08/14/2015 12:00:00 AM	4743876.03	130.385	005274		08/14/2015 12:00:00 AM	2931791.19	58.118	005275
08/14/2015 01:00:00 AM	4744008.406	132.376	005274		08/14/2015 01:00:00 AM	2931849.35	58.16	005275
08/14/2015 02:00:00 AM	4744141.74	133.334	005274		08/14/2015 02:00:00 AM	2931908.534	59.184	005275
08/14/2015 03:00:00 AM	4744272.553	130.813	005274		08/14/2015 03:00:00 AM	2931966.686	58.152	005275
08/14/2015 04:00:00 AM	4744404.045	131.492	005274		08/14/2015 04:00:00 AM	2932023.589	56.903	005275
08/14/2015 05:00:00 AM	4744534.38	130.335	005274		08/14/2015 05:00:00 AM	2932080.05	56.461	005275
08/14/2015 06:00:00 AM	4744667.111	132.731	005274		08/14/2015 06:00:00 AM	2932137.05	57	005275
08/14/2015 07:00:00 AM	4744820.038	152.927	005274		08/14/2015 07:00:00 AM	2932232.983	95.933	005275
08/14/2015 08:00:00 AM	4744972.221	152.183	005274		08/14/2015 08:00:00 AM	2932319.162	86.179	005275
08/14/2015 09:00:00 AM	4745134.467	162.246	005274		08/14/2015 09:00:00 AM	2932404.691	85.529	005275
08/14/2015 10:00:00 AM	4745308.905	174.438	005274		08/14/2015 10:00:00 AM	2932489.976	85.285	005275
08/14/2015 11:00:00 AM	4745476.832	167.927	005274		08/14/2015 11:00:00 AM	2932564.419	74.443	005275
08/14/2015 12:00:00 PM	4745634.44	157.608	005274		08/14/2015 12:00:00 PM	2932634.064	69.645	005275
08/14/2015 01:00:00 PM	4745789.345	154.905	005274		08/14/2015 01:00:00 PM	2932704.723	70.659	005275
08/14/2015 02:00:00 PM	4745949.369	160.024	005274		08/14/2015 02:00:00 PM	2932777.373	72.65	005275
08/14/2015 03:00:00 PM	4746110.346	160.977	005274		08/14/2015 03:00:00 PM	2932845.908	68.535	005275
08/14/2015 04:00:00 PM	4746270.903	160.557	005274		08/14/2015 04:00:00 PM	2932920.525	74.617	005275
08/14/2015 05:00:00 PM	4746431.347	160.444	005274		08/14/2015 05:00:00 PM	2932996.835	76.31	005275
08/14/2015 06:00:00 PM	4746586.415	155.068	005274		08/14/2015 06:00:00 PM	2933065.518	68.683	005275
08/14/2015 07:00:00 PM	4746727.476	141.061	005274		08/14/2015 07:00:00 PM	2933127.559	62.041	005275
08/14/2015 08:00:00 PM	4746864.372	136.896	005274		08/14/2015 08:00:00 PM	2933195.384	67.825	005275
08/14/2015 09:00:00 PM	4747004.372	140	005274		08/14/2015 09:00:00 PM	2933263.632	68.248	005275
08/14/2015 10:00:00 PM	4747137.886	133.514	005274		08/14/2015 10:00:00 PM	2933323.26	59.628	005275
08/14/2015 11:00:00 PM	4747269.569	131.683	005274		08/14/2015 11:00:00 PM	2933382.3	59.04	005275

Reed Arena (TAMU Bldg #1554)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
ELE	006243	21	5/4/2016-5/24/2016	Model

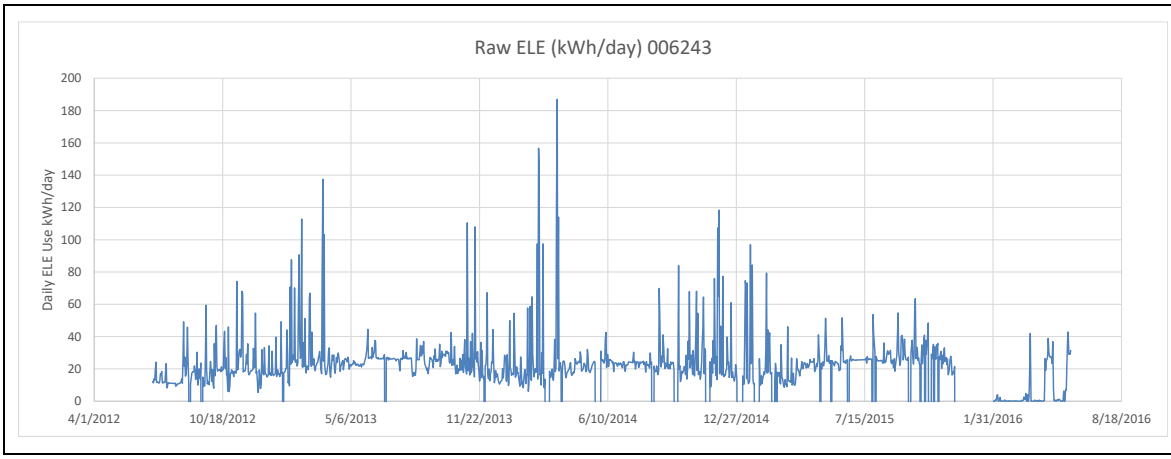
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE	The consumption decreased largely.	2/1/2016-3/28/2016 3/30/2016-4/19/2016 5/4/2016-5/24/2016

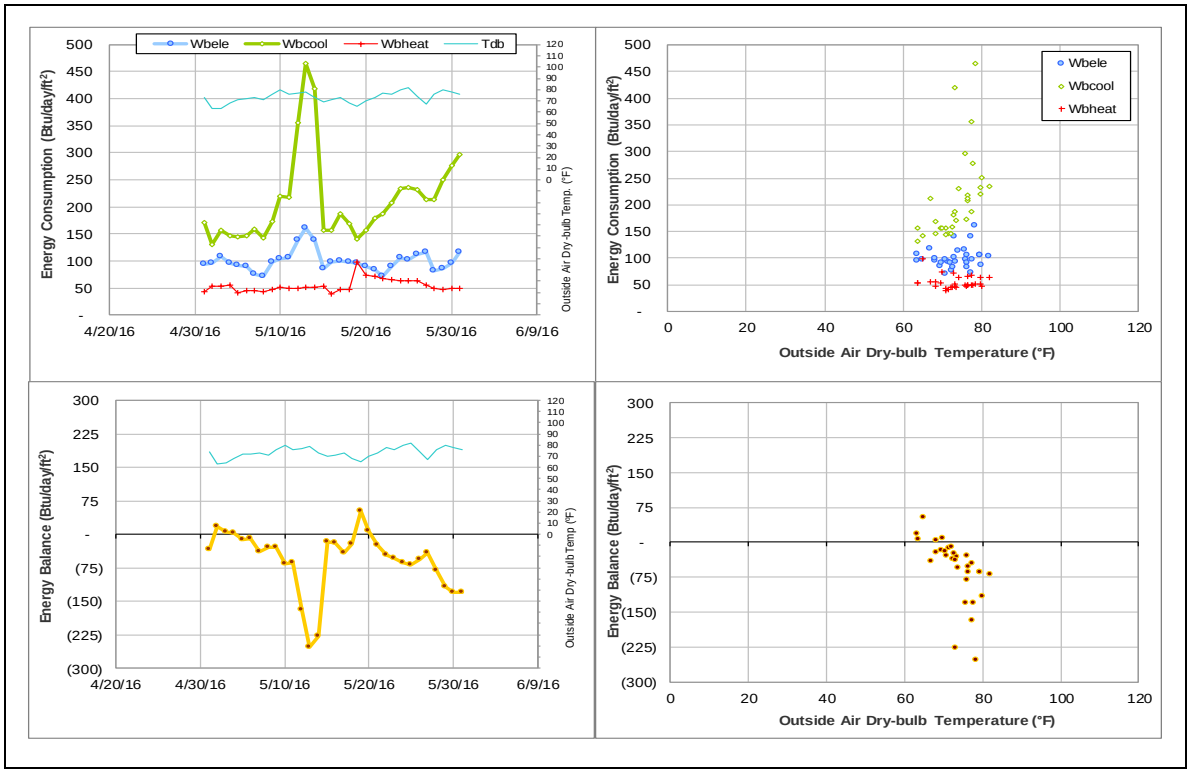
Quantitative descriptions and comments

There are three ELE meters for this building. The consumption for one of them (ELE MID 006243) only counts for around 0.3% of total ELE consumption for this building. The consumption for ELE MID 006243 decreased to nearly zero since 2/1/2016. It increased back on 3/28/2016, but decreased to nearly zero during 3/30/2016 – 4/19/2016 and 5/4/2016-5/24/2016. However, it doesn't affect the energy balance. The problematic consumption was estimated by a model based on the data during 1/1/2015 – 12/31/2015.

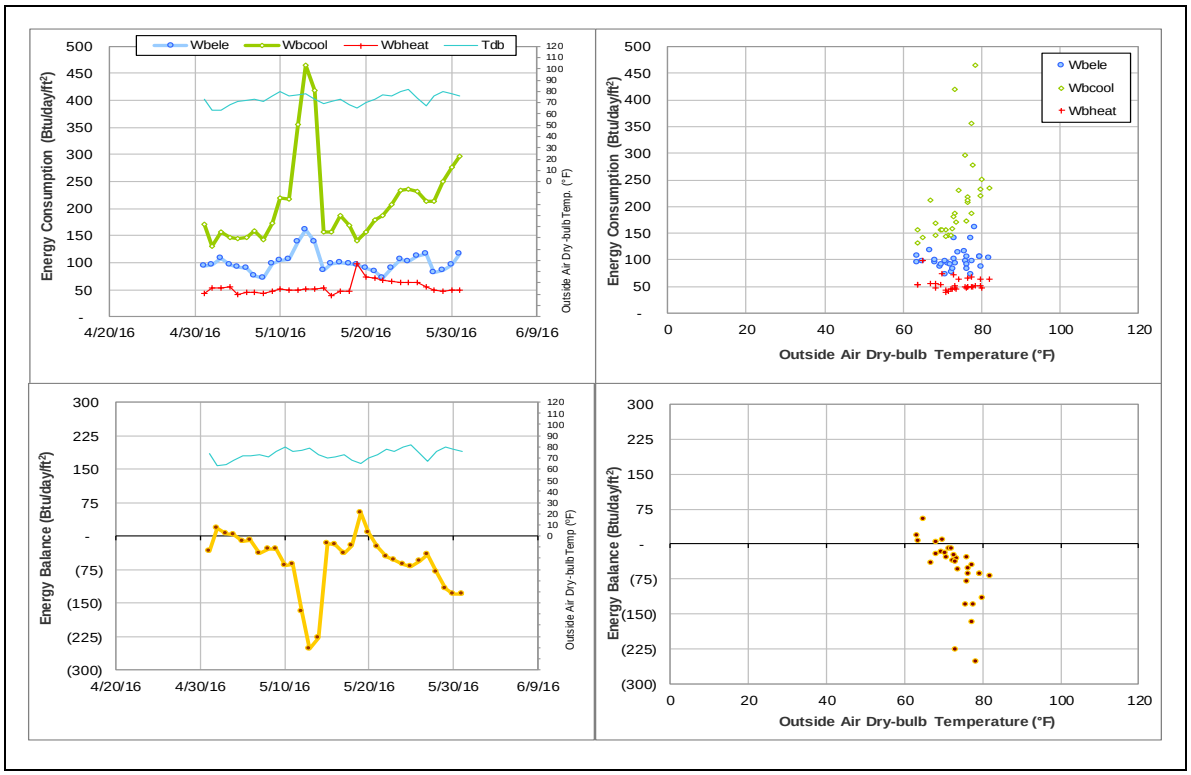
Explanatory Figure: Time series plot for ELE meter 006243



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Gilchrist TTI Building (TAMU Bldg #1600)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
ELE	005286	8	5/19/2016-5/26/2016	Model

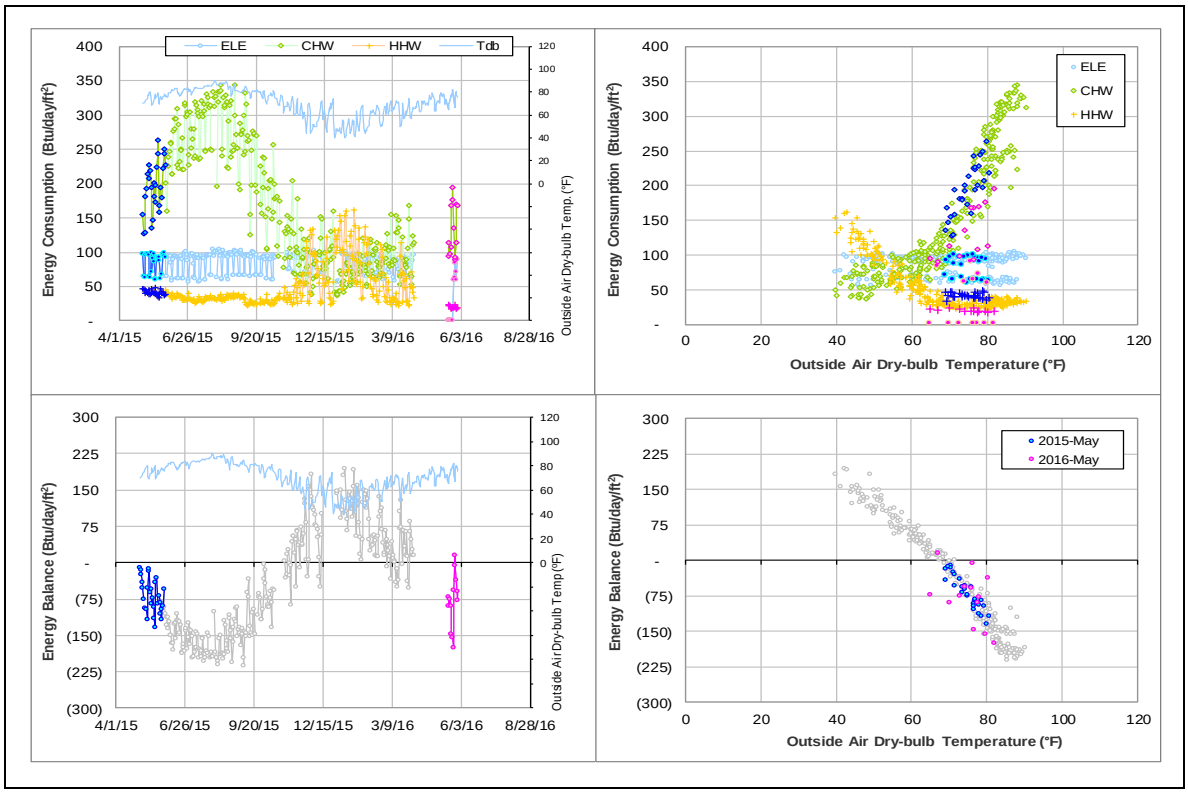
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE	The consumption level has decreased suddenly.	5/19/2016-5/26/2016

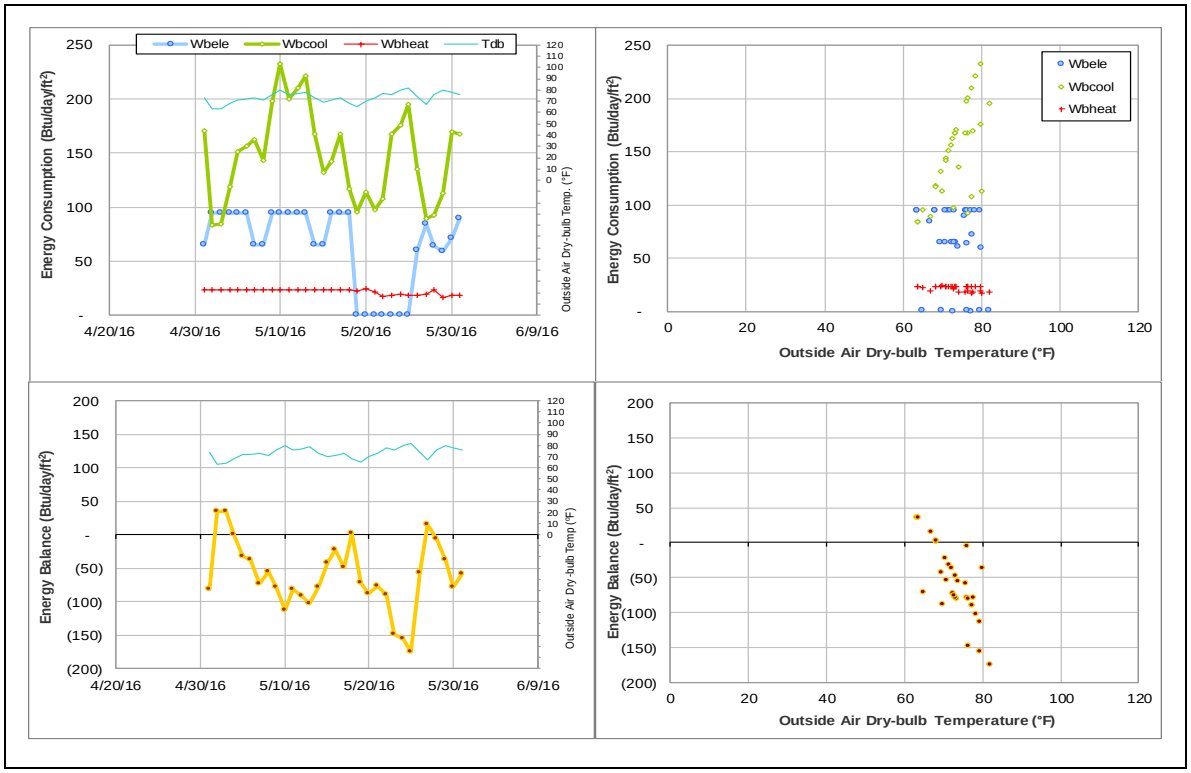
Quantitative descriptions and comments

The ELE had missing data since 4/7/2016. The data became available on 5/19/2016 but the consumption is very low, close zero. It increased back to previous level after 5/26/2016. The missing and low consumption was estimated by a model.

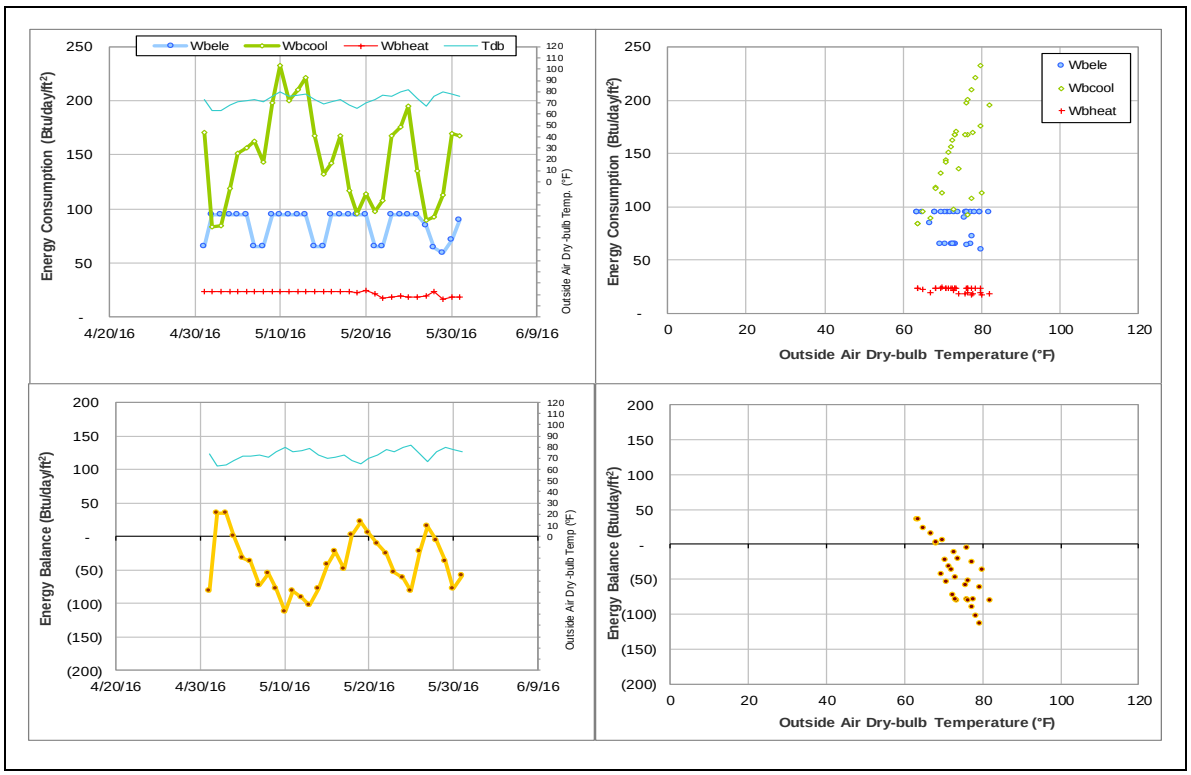
Explanatory Figure: 13 months energy balance plot with original data



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



Multi-Species Research Building (TAMU Bldg #1911)

Estimated data

Energy Type	Meter ID	Number of Days	Period	Estimation Method
HHW	0090133	20	5/12/2016-5/31/2016	Average

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	The consumption decreased to zero.	5/13/2016-5/15/2016 5/19/2016-5/26/2016
	The consumption level is higher than the level during the past year.	5/16/2016-5/18/2016 5/27/2016-5/31/2016

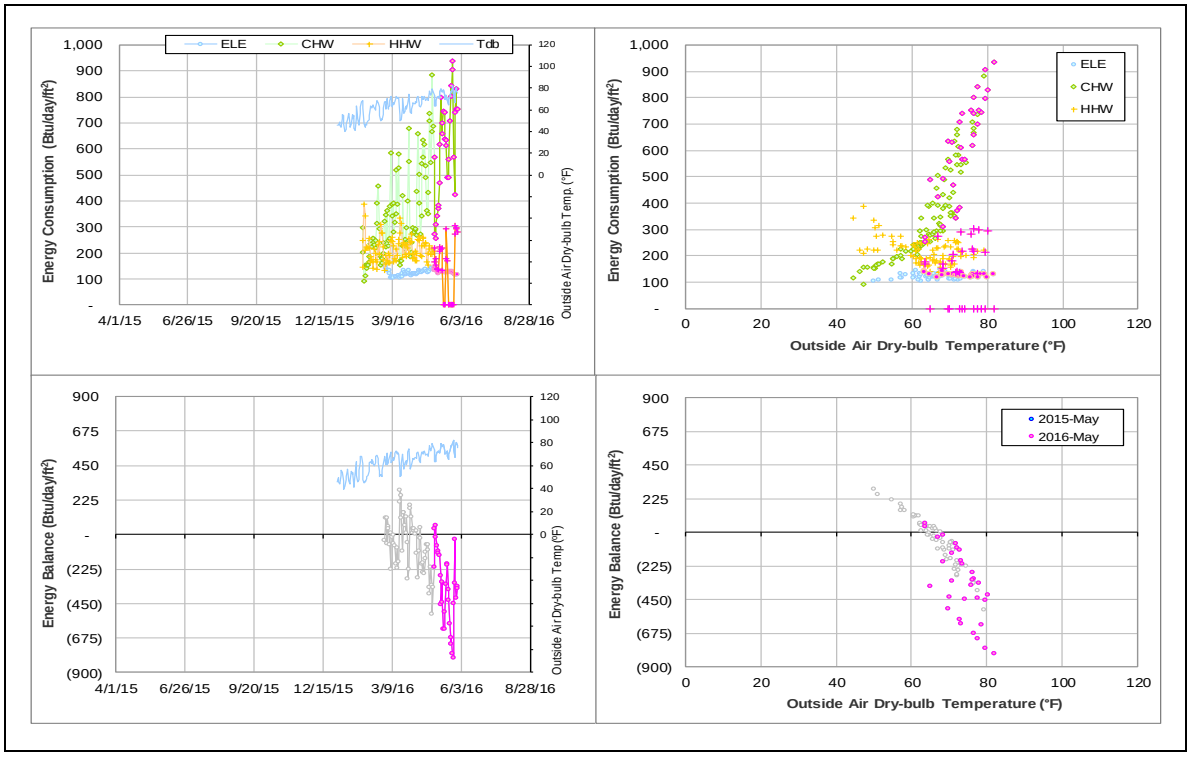
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
HHW	0090133	5/13/2016-5/15/2016 5/19/2016-5/26/2016	Flow rate	Decreased to zero

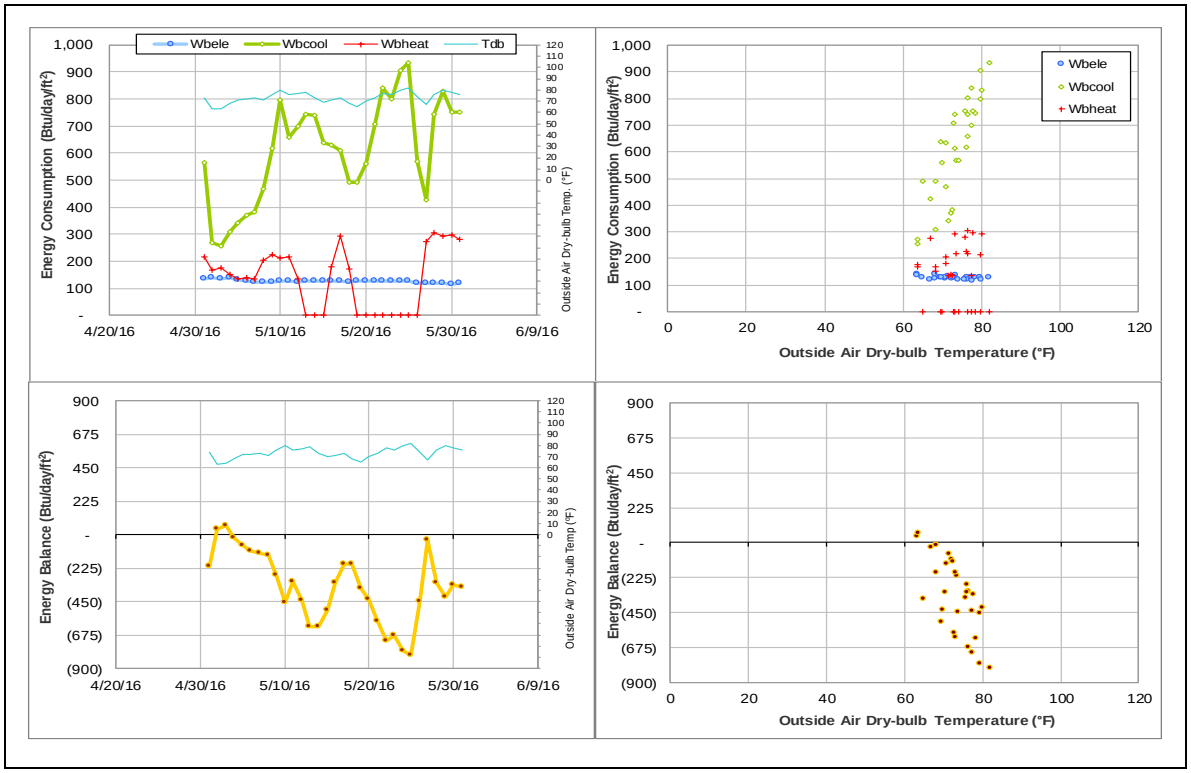
Quantitative descriptions and comments

The HHW consumption deceased to zero during 5/13/2016-5/15/2016 and 5/19/2016-5/26/2016 caused by a zero reading of flow rate. And the consumption for 5/16/2016-5/18/2016 and 5/27/2016-5/31/2016 is around 100 Btu/day/ft^2 higher than the previous level. The consumption after 5/12/2016 was estimated by an average of other available reasonable data in this month.

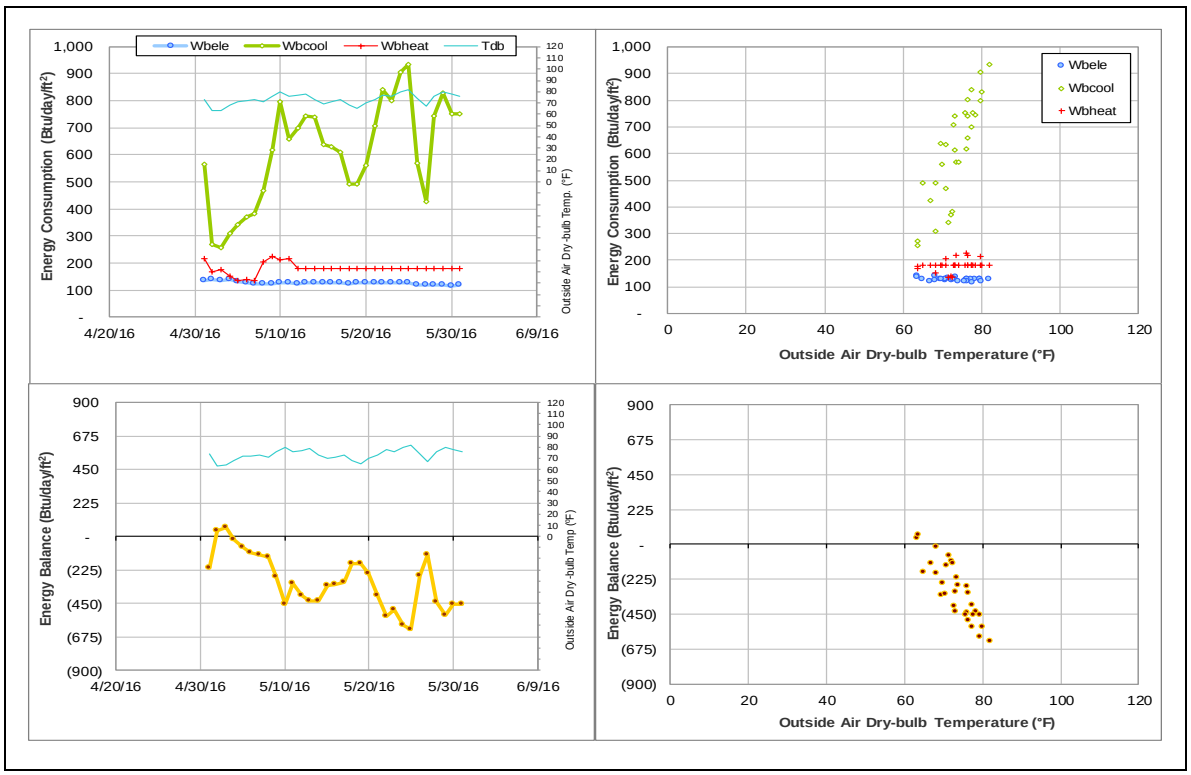
Explanatory Figure: 13 months energy balance plot with original data



Energy balance plot using the original data for the month of analysis. Missing data have been filled in, if any.



Energy balance plot using the estimated data for the month of analysis



II-3 Meters with Significant Issues in Energy Consumption Data

In this section, significant issues in the data behavior are described. On the contrary to the section II–2, alternative consumption is not estimated for some reasons: presence of continuous problems since the beginning of the data acquisition, unbalanced energy uses in the past data, changes in the consumption patterns without evidence of data problems, etc. Table II–3 gives a list of meters included in this section.

Table II-3 Meters with significant issues in the consumption data during May 2016

Building No.	Building Name	MeterID	Type
290	Wells Residence Hall		
		001984	CHW
		001988	HHW
291	Rudder Residence Hall		
		002132	CHW
		002136	HHW
293	Appelt Residence Hall		
		002062	CHW
		002066	HHW
353	Bright Aerospace Building		
		002746	CHW
		002757	HHW
394	Underwood Residence Hall		
		000014	ELE
		002117	CHW
		002121	HHW
412	Moses Residence Hall		
		002384	CHW
433	Mosher Residence Hall		
		009083	ELE
		002489	HHW
457	TAES Annex Building		
		005917	HHW
463	Psychology Building		
		002941	CHW
465	Butler Hall		
		004000	CHW
		004004	HHW
467	Biological Sciences Building - East		
		001543	ELE
468	Evans Library		
		003701	CHW
		003895	CHW
		003903	CHW
		003911	CHW
		003712	HHW
		003899	HHW
		003907	HHW
		003922	HHW
		005303	HHW
471	Pavilion		
		002780	HHW
478	Scoates Hall		
		007961	ELE
		007968	CHW
		007969	HHW
496	Utilities & Energy Services Central Office		
		007706	ELE
		006929	CHW
		006933	HHW
499	Engineering Innovation Center		
		002672	CHW
		002683	HHW
506	Nagle Hall		
		001484	ELE
524	Blocker building		
		002918	HHW
880	TVMC-Small Animal Building		
		005962	HHW
1026	Veterinary Medicine Administration		
		006053	HHW
1146	Biological Control Facility		
		005795	ELE
1156	Physical Plant Administration & Shops		
		007679	CHW
1197	Veterinary Research Building		
		006355	ELE
		006359	ELE
1501	Kleberg Center		
		002624	CHW
1559	West Campus Parking Garage		
		004322	CHW
1601	International Ocean Discovery Building		
		006351	ELE
		006382	CHW
		008144	CHW
		008145	HHW
1604	Offshore Technology Research Center		
		006660	ELE
		008142	CHW
		008143	HHW
1611	Engineering Research Building		
		008462	ELE
		008463	CHW
		008467	HHW

Wells Residence Hall (TAMU Bldg #290)

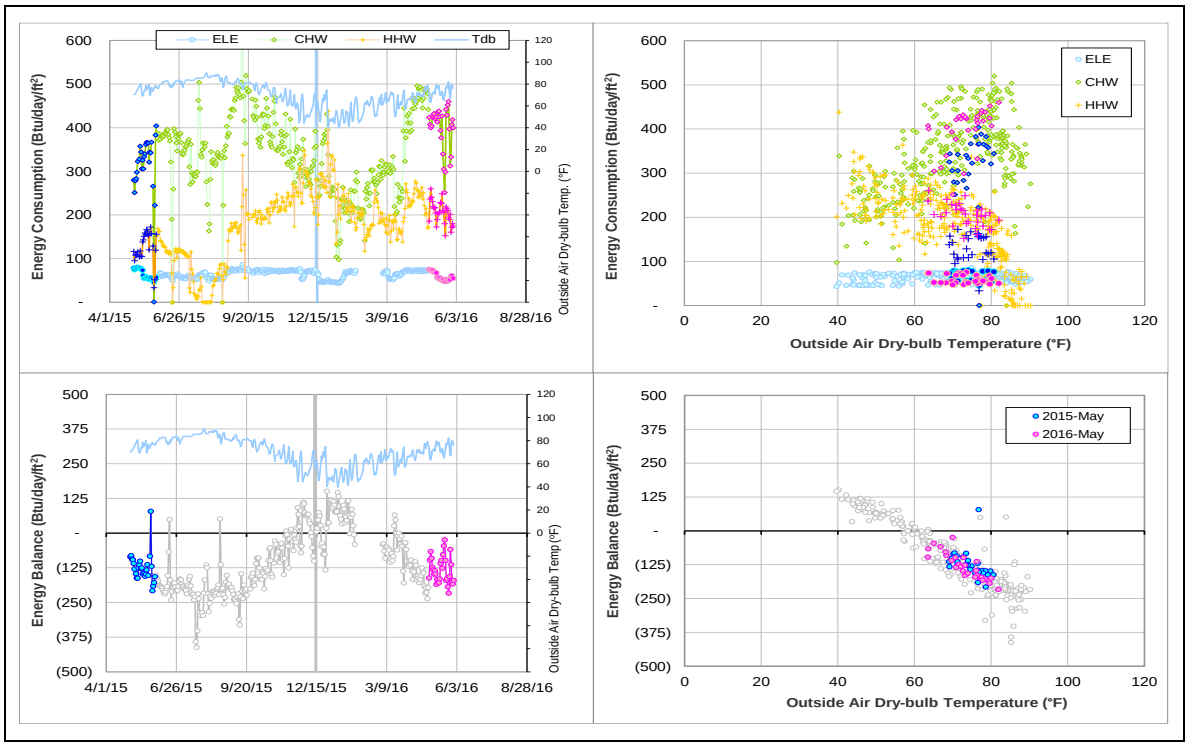
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW/HHW	Both the CHW and HHW consumption levels are higher than the same month of last year.	Since April 2016

Comments

Both the CHW and HHW consumption increased since the month of April 2016. The CHW/HHW consumption of this month was about 100 Btu/day/ft^2 higher than the same month of last year. This building has a low level of energy balance load with the cross-point temperature around 60°F. The low E_{BL} level suggests imbalance of metered energy use in the building, but we are not able to determine the cause.

Explanatory Figure: 13 months energy balance plot with original data



Rudder Residence Hall (TAMU Bldg #291)

Detected issues in the energy balance and/or the consumption data

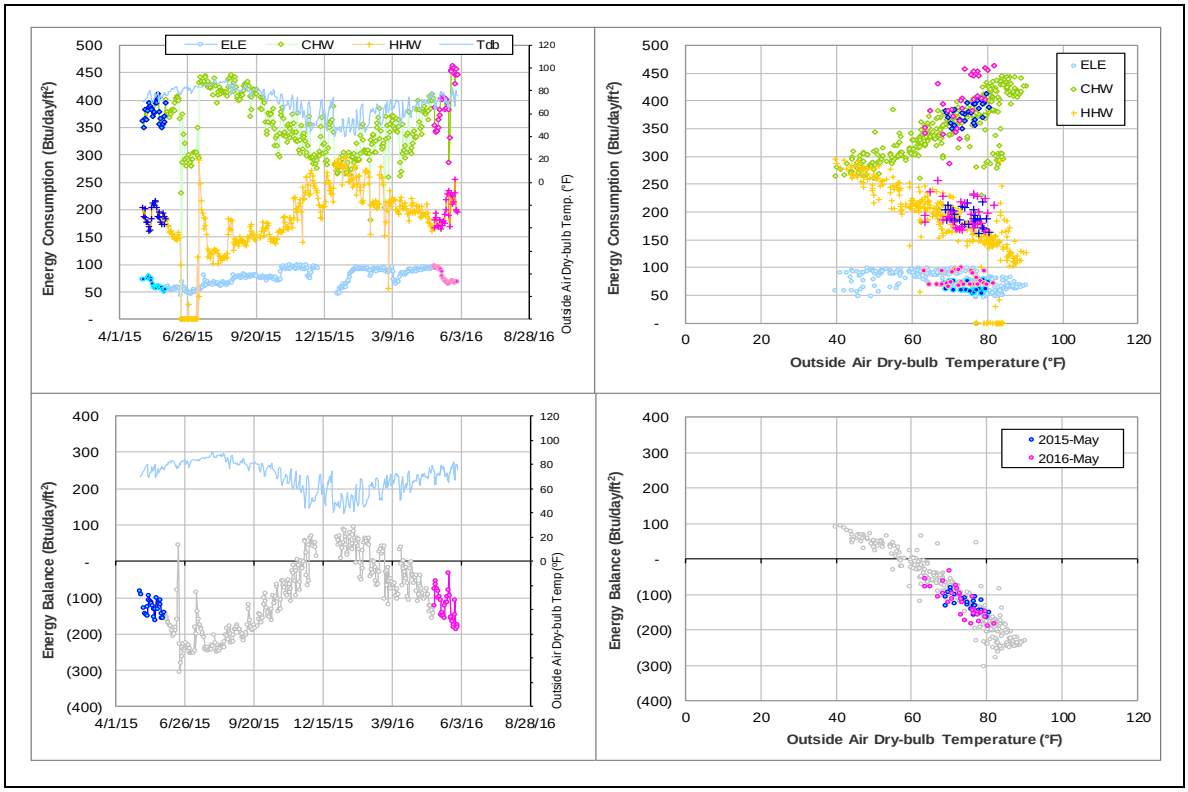
Data Type	Description of data behaviors	Period
Energy Balance	The energy balance level is low. The cross-point temperature is around 60°F.	For several years
CHW/HHW	The consumption level has suddenly increased.	Since 5/22/2016

Comments

This building has a low level of energy balance load with the cross-point temperature around 60°F for the past year. The low E_{BL} level suggests imbalance of metered energy use in the building, but we are not able to determine the cause.

The CHW and HHW consumption increased about 50 Btu/day/ft^2 since 5/22/2016, but the energy balance pattern didn't change.

Explanatory Figure: 13 months energy balance plot with original data



Appelt Residence Hall (TAMU Bldg #293)

Detected issues in the energy balance and/or the consumption data

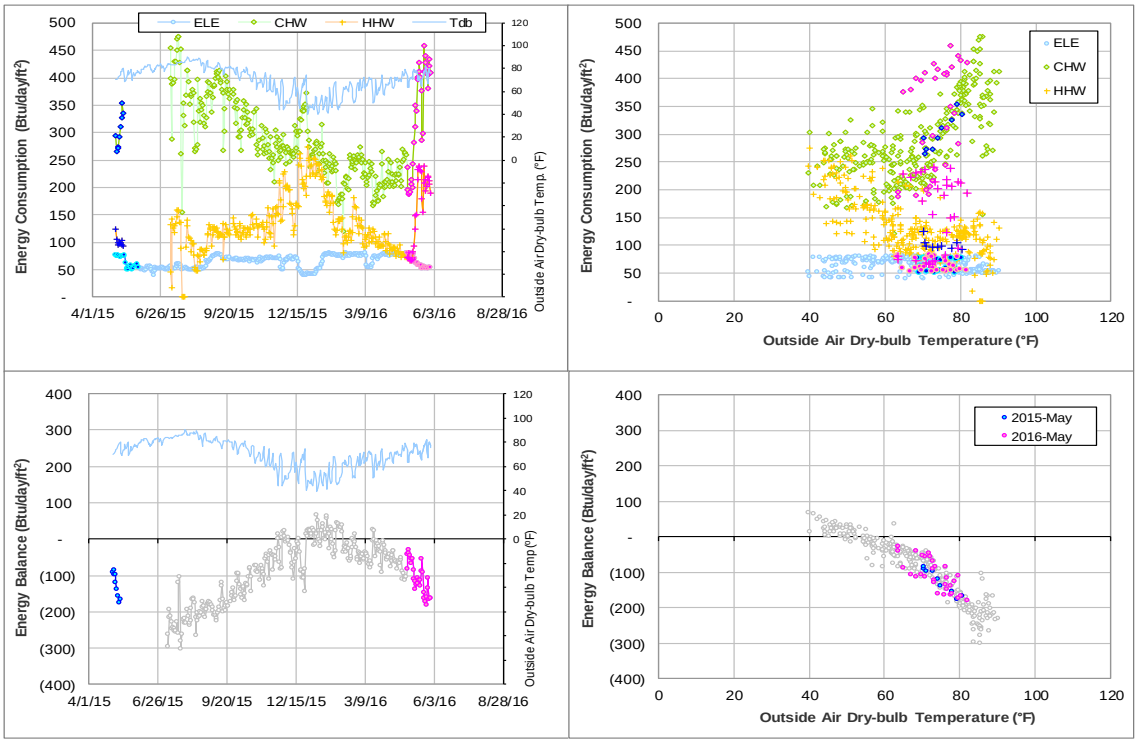
Data Type	Description of data behaviors	Period
CHW	The consumption level suddenly decreased.	Since December 2014
HHW	The consumption gradually decreased.	Since January 2015
Energy Balance	The energy balance decreased and the cross-point temperature is around 55°F.	Since January 2015
CHW/HHW	The consumption level has gradually increased.	Since 5/10/2016

Comments

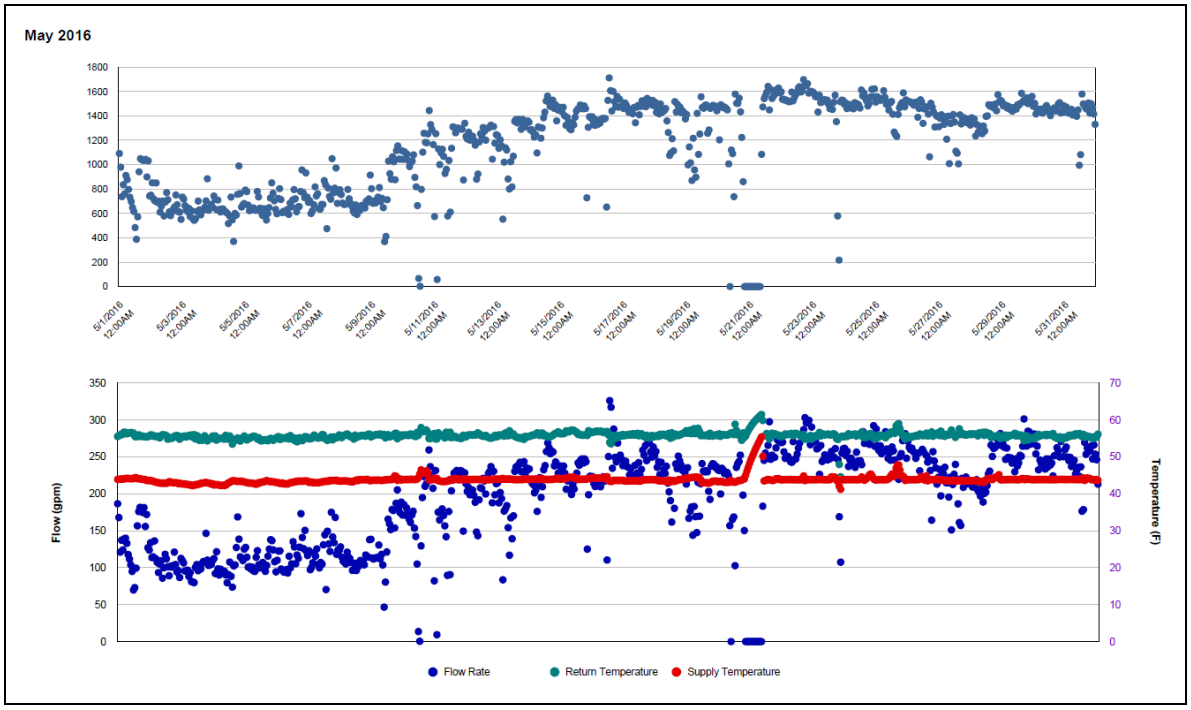
Both the CHW and HHW consumption levels have decreased, respectively. As a result, the energy balance load was low with the cross-point temperature around 55°F. The low E_{BL} level suggests imbalance of metered energy use in the building, but we are not able to determine the cause.

Both the CHW and HHW consumption gradually increased by 150 Btu/day/ft^2 starting from 4/30/2016, as the CHW and HHW flow rates gradually increased by 140 gpm, respectively. However, the energy balance pattern didn't change.

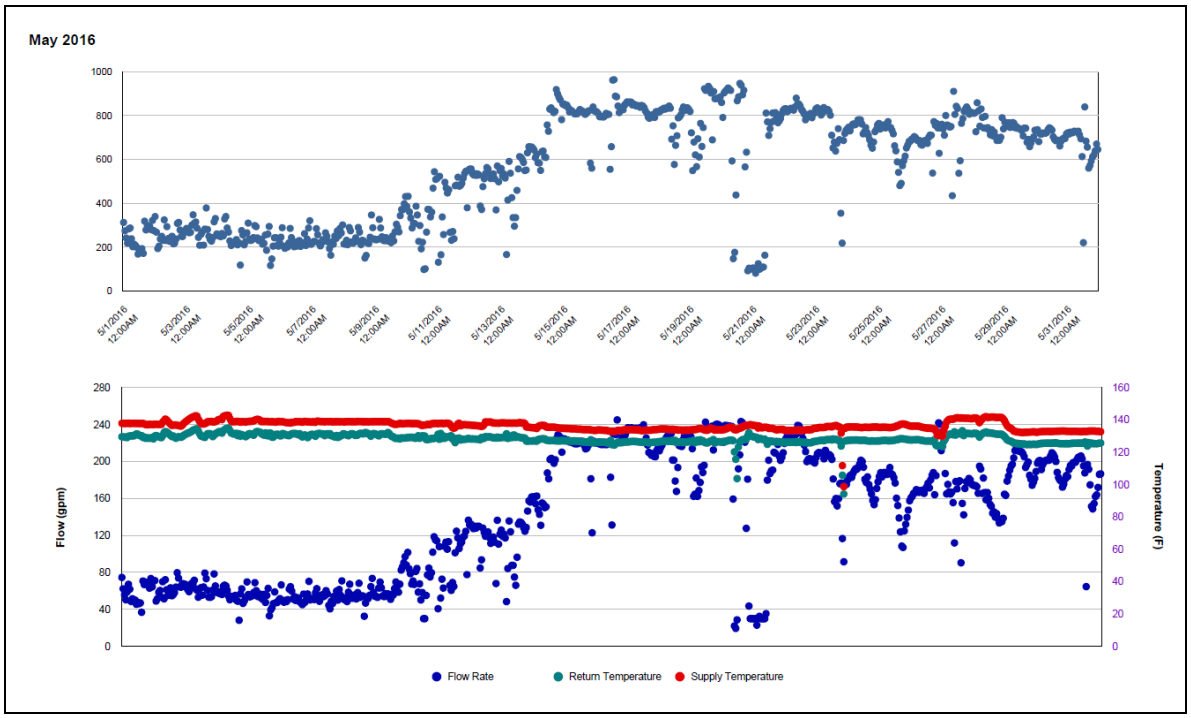
Explanatory Figure: 13 months energy balance plot with original data



Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (CHW during May 2016)



Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office. (HHW during May 2016)



Lechner Residence Hall (TAMU Bldg #294)

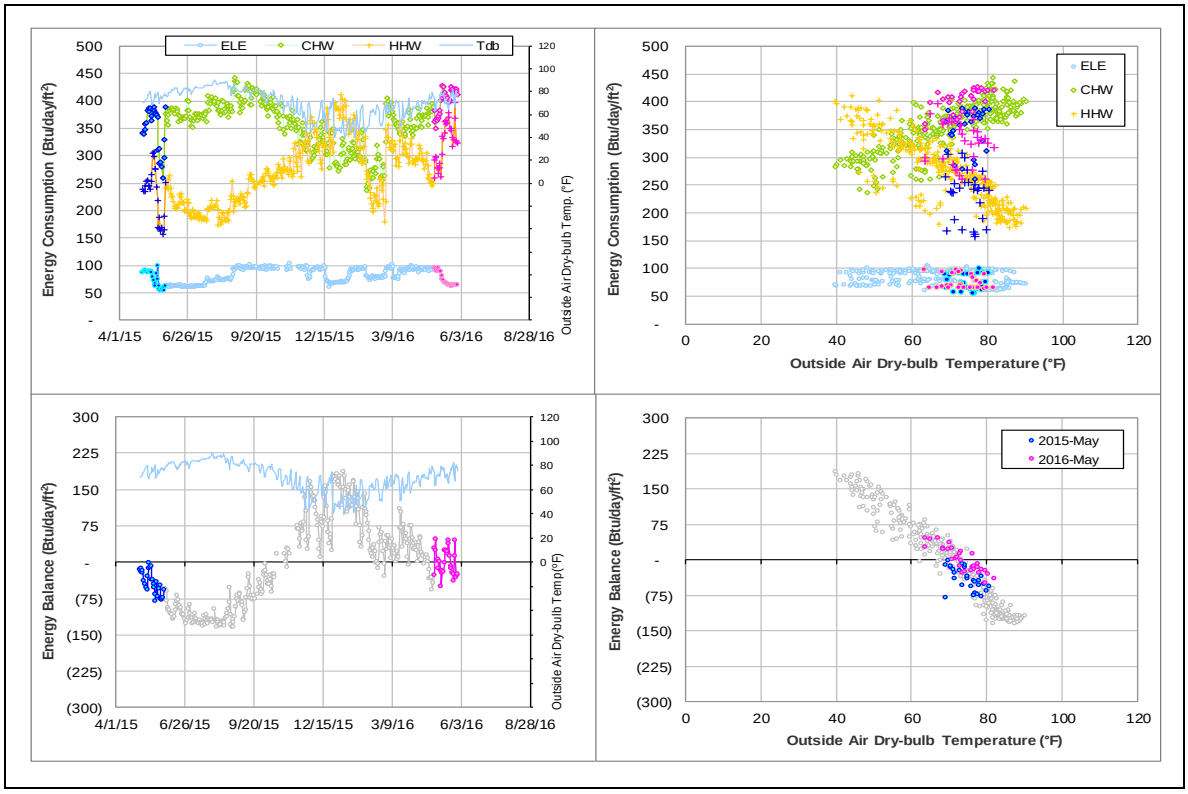
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE	The consumption level has gradually decreased.	Since 5/11/2016
CHW/HHW	The consumption level has gradually increased.	Since 5/11/2016

Comments

Since 5/11/2016, the CHW and HHW consumption have increased by 50 Btu/day/ft^2 and 80 Btu/day/ft^2, respectively, and the ELE consumption decreased by 30 Btu/day/ft^2. However, the energy pattern didn't change much, with the cross point temperature around 70 °F.

Explanatory Figure: 13 months energy balance plot with original data



Bright Building (TAMU Bldg #353)

Detected issues in the energy balance and/or the consumption data

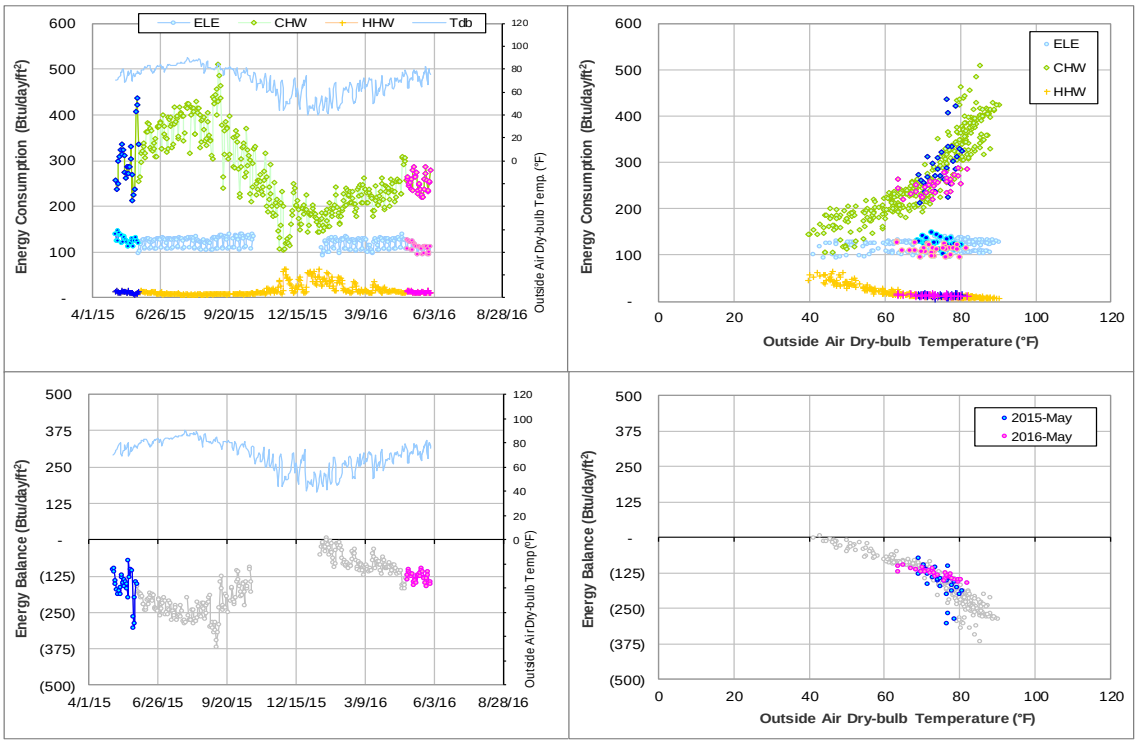
Data Type	Description of data behaviors	Period
Energy Balance	The energy balance level has been low for years. The cross-point temperature was in the range of 40 - 70 °F.	For several years
	The energy balance level increased to more reasonable level.	October 2014 – December 2015
	The energy balance level decreased.	January 2016 - ongoing

Comments

The energy balance load (E_{BL}) of this building has been low and the cross-point temperature was around 50°F for years. The electricity use level was in a typical range for office and classroom buildings on campus. Therefore, either CHW or HHW consumption might be causing the unbalanced energy balance in the building.

The CHW consumption gradually decreased since October 2014, which made the energy balance shifted to more reasonable range and the temperature at E_{BL} = 0 was 60°F. The HHW consumption increased during January to March of 2015, but then it decreased back and even a little lower for recent months. As a result, the energy balance decreased with the cross point temperature lower than 50°F.

Explanatory Figure: 13 months energy balance plot with original data



Underwood Hall (TAMU BLDG # 394)

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW and HHW	The consumption varied frequently.	Since June 2015
CHW	The consumption pattern was very scattering and no clear temperature dependence was observed.	For one year
ELE	The consumption gradually decreased.	Middle of May 2016

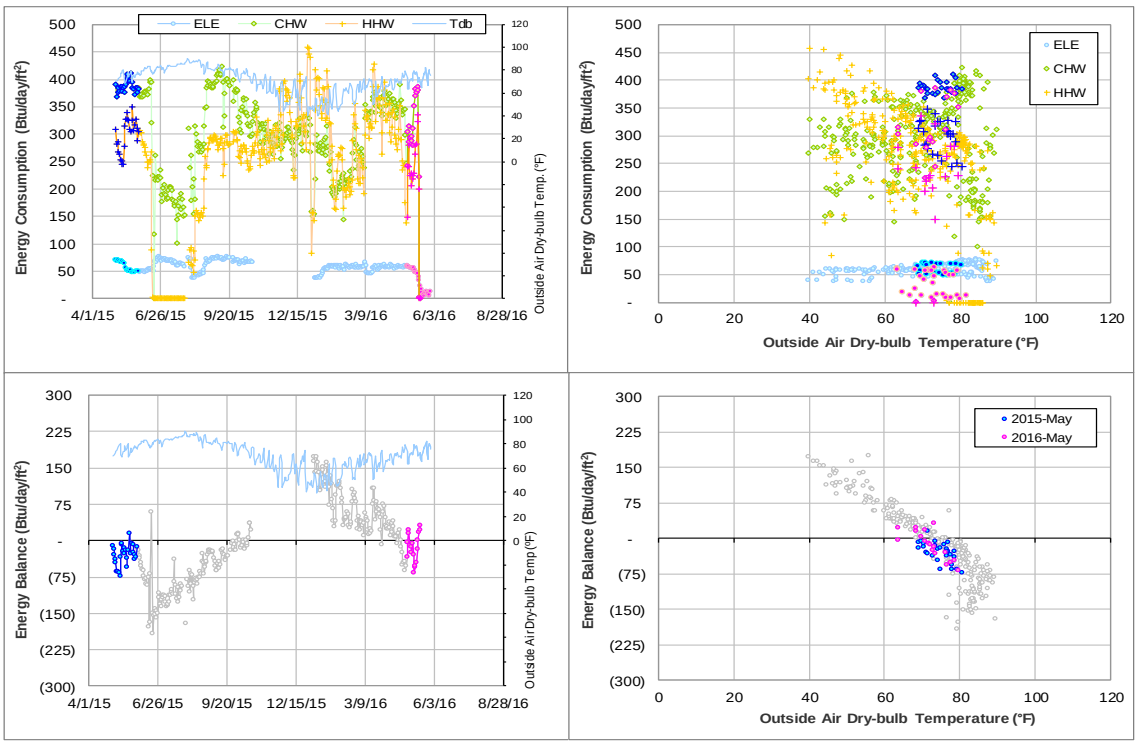
Comments

Both CHW and HHW consumption increased or decreased at the same time since June 2015. As we know, VFDs have been installed for HHW and CHW in December 2014 and June 2015, respectively.

The CHW consumption pattern was very scattering and no clear temperature dependence was observed for last year. It is suggested to investigate this meter.

The ELE consumption gradually decreased by 50 Btu/day/ft^2 (75%) during the middle of May 2016.

Explanatory Figure: 13 months energy balance plot with original data



Moses Residence Hall (TAMU BLDG # 412)

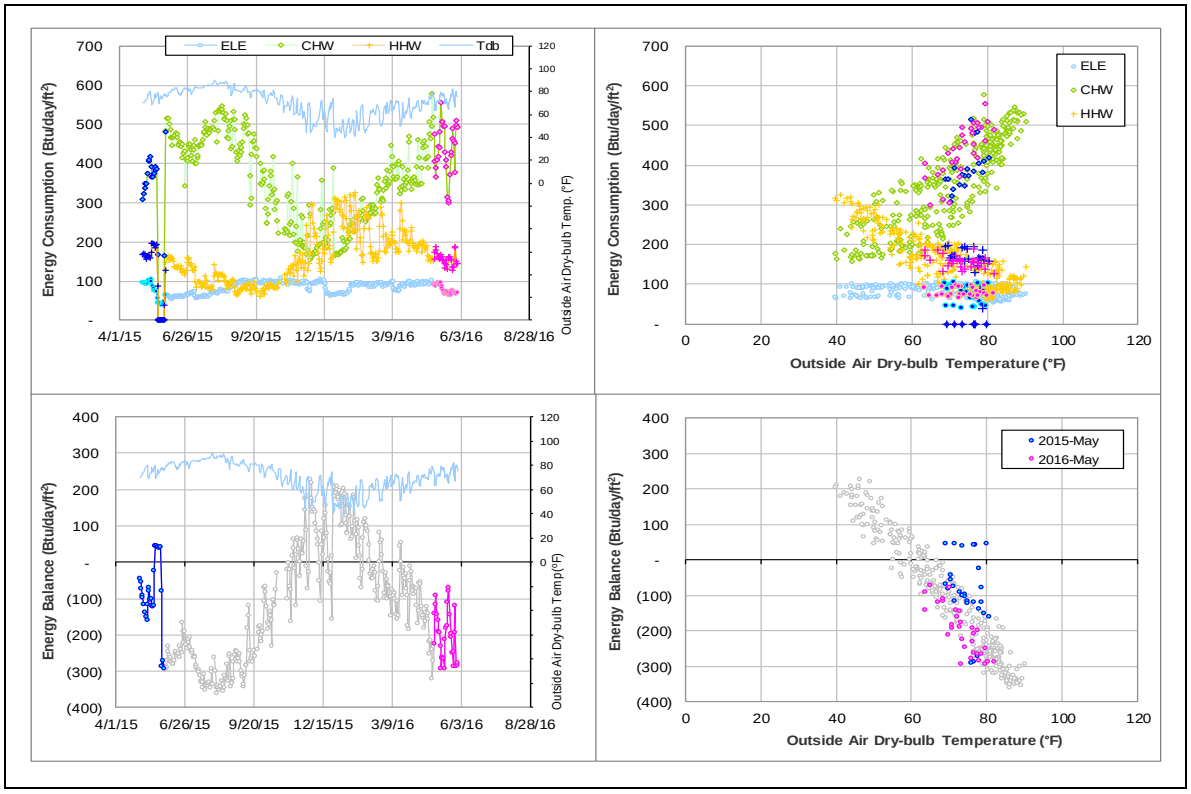
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption level was higher than the same month of last year.	Since March 2016
Energy Balance	The energy balance decreased and the cross-point temperature was around 55°F.	Since March 2016

Comments

The CHW consumption was about 80 Btu/day/ft^2 higher than the same month of the last year since March 2016, which resulted the lower energy balance with the cross-point temperature decreased from 65°F to 55°F.

Explanatory Figure: 13 months energy balance plot with original data



Mosher Residence Hall (TAMU BLDG # 433)

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE	The consumption level suddenly decreased.	Since 1/23/2016
ELE	The consumption gradually decreased.	Middle of May 2016
HHW	The consumption gradually increased.	Middle of May 2016

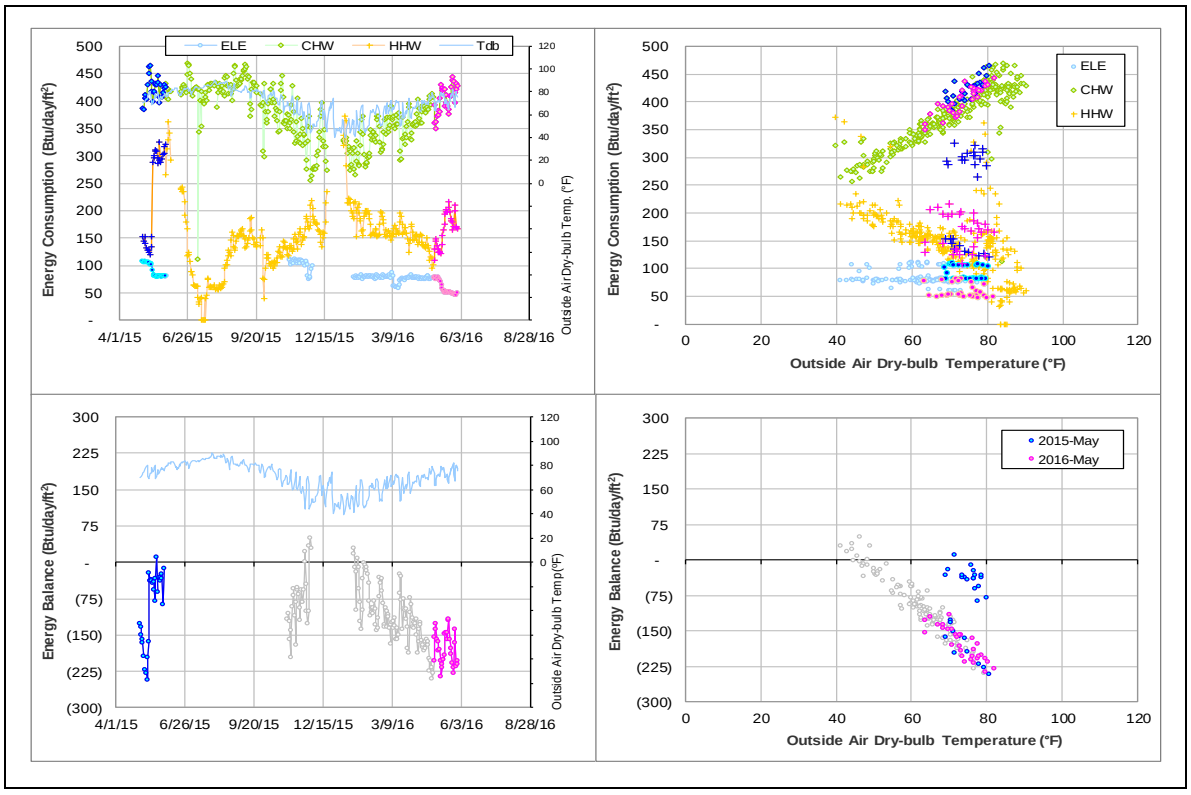
Comments

The cross-point temperature for this building was around 55°F before March 2015. CHW consumption increased 50- 100 Btu/day/ft^2 due to an increase of flow rate after March 2015 and the pattern was stable over one year. As a result, the cross-point temperature decreased from ~ 55°F to ~50°F.

The ELE meter (MID 009083) replaced old meter (MID 000290) since January 2016. After that, the consumption decreased from ~105 Btu/day/ft^2 to ~80 Btu/day/ft^2 (approximately 25%). The CHW and HHW consumption levels didn't changed. The cross-point temperature was further decreased and it is lower than 50°F now. It is suggested to investigate this meter.

In the middle of May 2016, the ELE further decreased to 50 Btu/day/ft^2 and the HHW consumption increased by 50 Btu/day/ft^2. However, the energy balance pattern didn't change.

Explanatory Figure: 13 months energy balance plot with original data



TAES Annex Building (TAMU BLDG # 457)

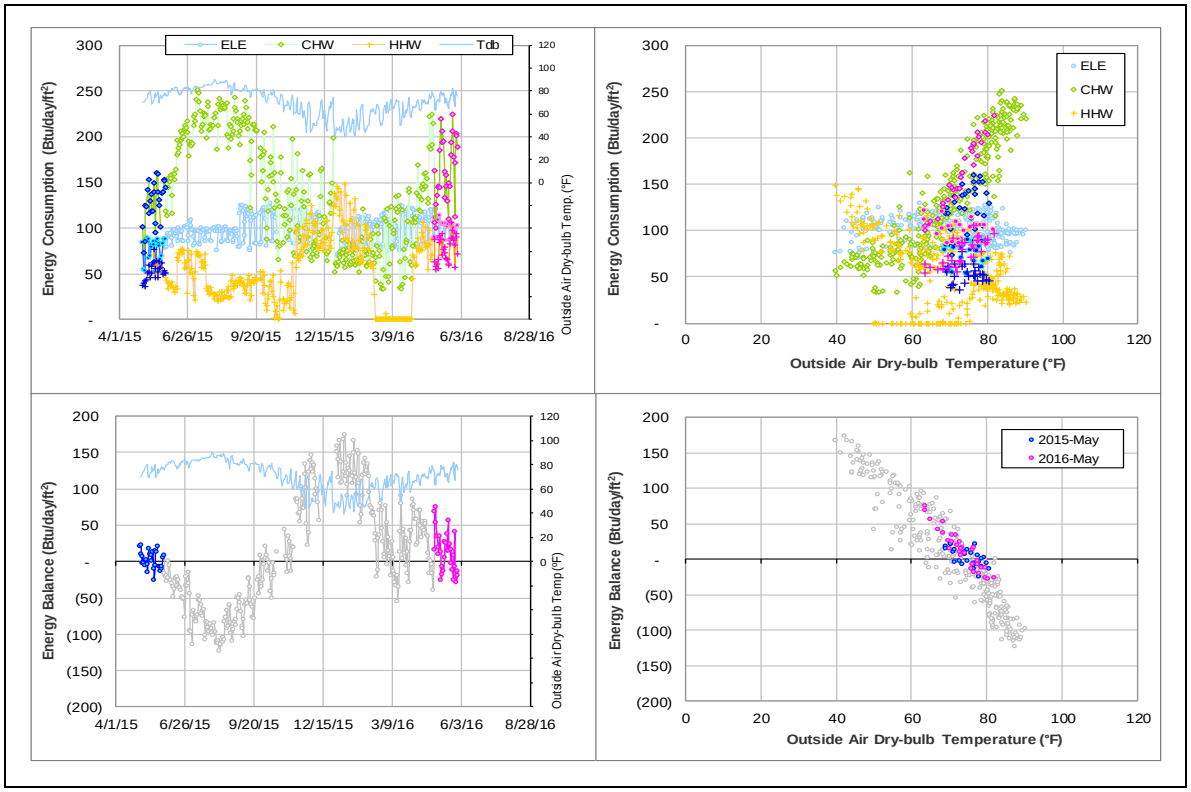
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	The consumption was zero.	2/17/2016 – 4/3/2016
HHW	The consumption followed a cooling pattern.	Since 4/4/2016

Comments

The HHW consumption was zero during 2/17/2016-4/3/2016, and then the HHW consumption followed a cooling pattern. It is suggested to investigate this meter.

Explanatory Figure: 13 months energy balance plot with original data



Psychology Building (TAMU Bldg #463)

Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
Energy Balance	The pattern scatters and the level is low.	For several years after ESCO implementation in 2011
CHW	The consumption pattern versus ambient temperature scatters.	

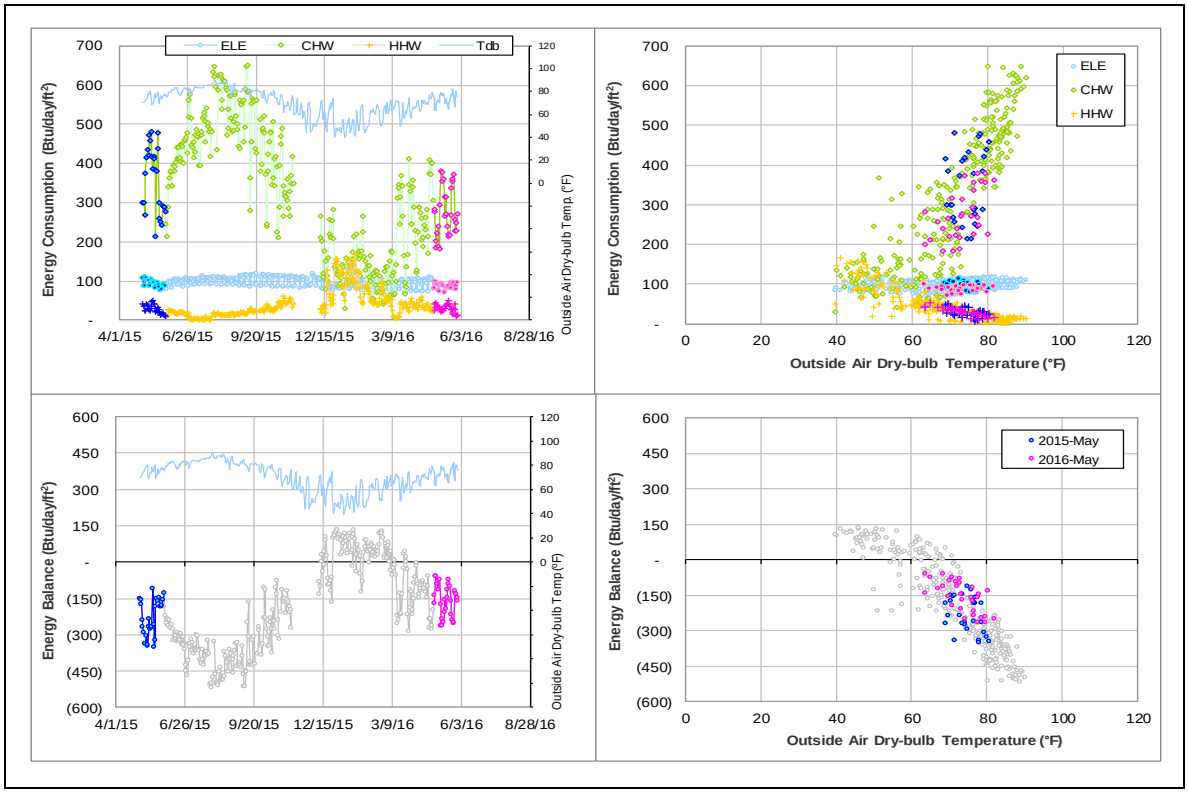
Changes in sensor readings related to the detected issues

Energy Type	Meter ID	Period	Type	Description
CHW	002941	11/29/2012–ongoing	Delta T	Large for office building

Quantitative descriptions and comments

The CHW consumption pattern versus ambient temperature started to scatter after ESCO implementation. The CHW consumption level is high, because the CHW temperature differential is around 20°F that is high for an office building with conventional HVAC systems. The cross-point temperature of the energy balance is 50 - 70°F. The building had energy efficiency improvements by ESCO during the period of 5/9/2011–8/19/2011.

Explanatory Figure: 13 months energy balance plot with original data



Butler Hall (TAMU Bldg #465)

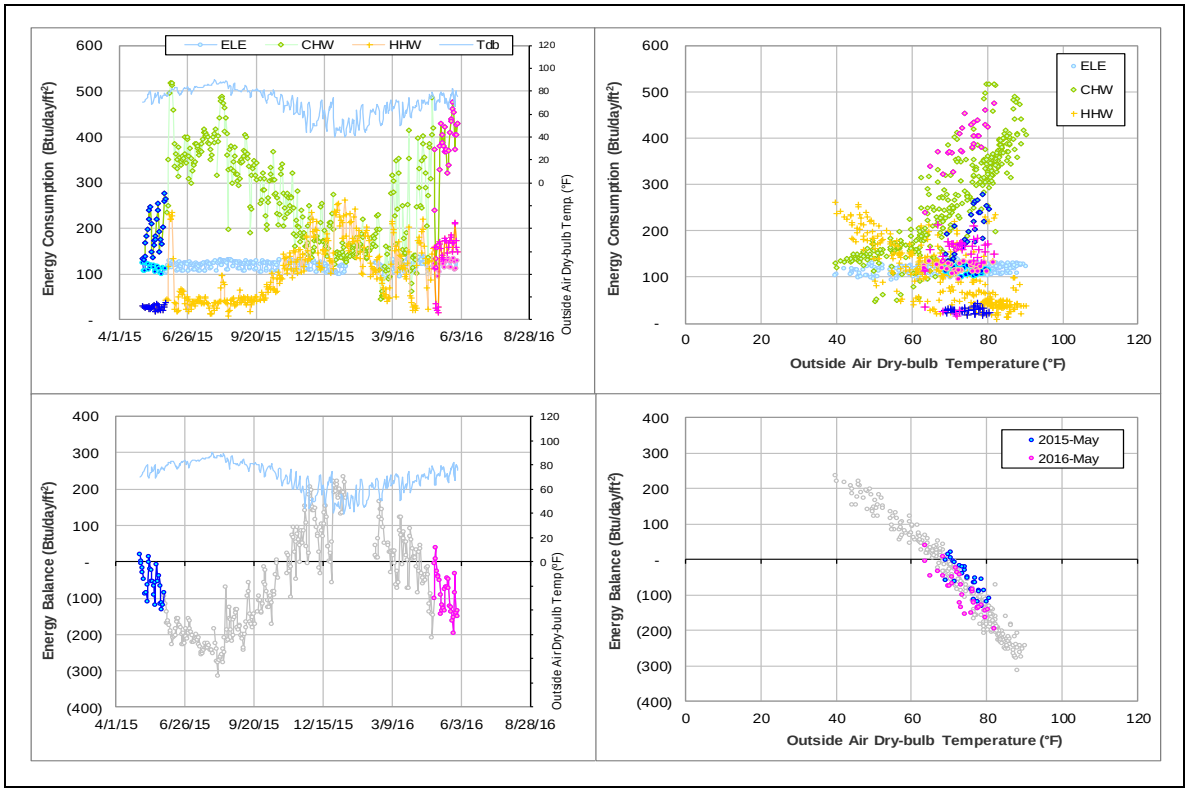
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW/HHW	The consumption level has suddenly increased and varied frequently.	Since 3/8/2016

Comments

Both the CHW and HHW consumption has suddenly increased about 100 Btu/day/ft^2 since 3/8/2016, and the consumption varied frequently. However, the energy balance pattern was still at a reasonable range, and the cross point temperature was around 65°F.

Explanatory Figure: 13 months energy balance plot with original data



Biological Sciences Building – East (TAMU Bldg # 467)

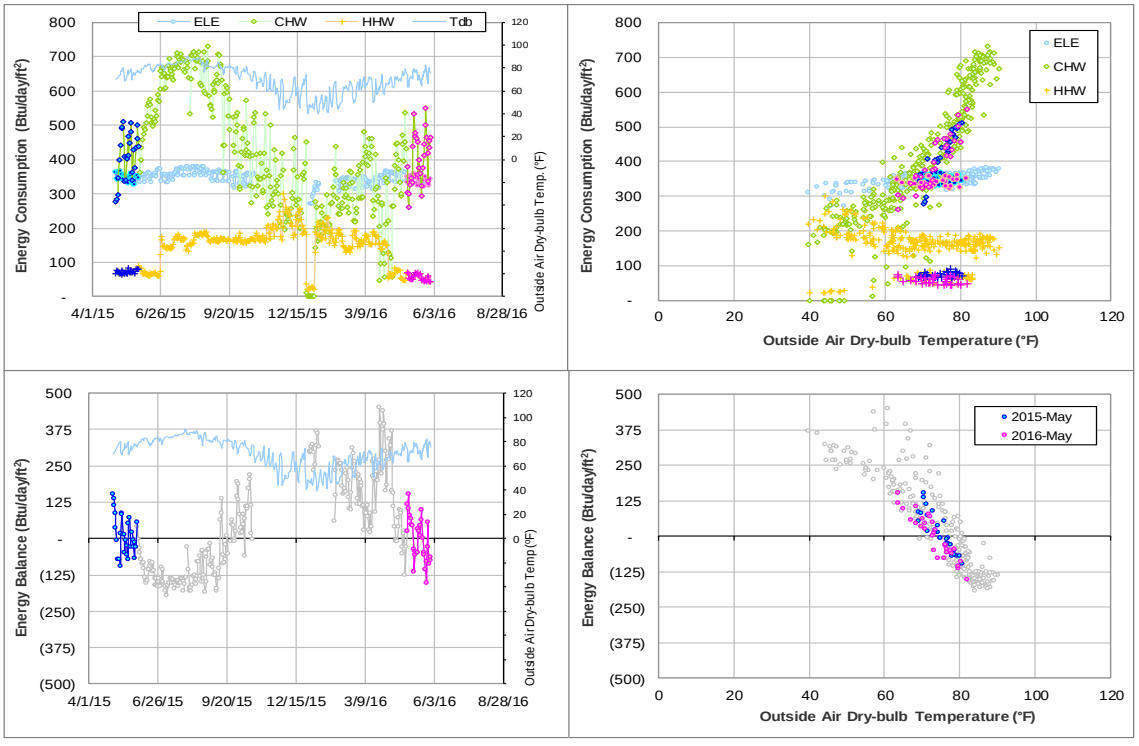
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE	The consumption level may be high.	1/2/2013–ongoing

Comments

The ELE consumption suddenly increased after 1/2/2013 by approximately 100 Btu/day/ft^2. There was a power outage in the building right before this increase. The CHW and HHW consumption levels did not change. The increased ELE usage level was in the range 290 - 390 Btu/day/ft^2 for the last year, which was higher than those for other buildings with similar functionality. For example, the ELE use range in the adjacent Biological Sciences Building – West (Bldg 449) was 190 –250 Btu/day/ft^2 during the same time period. These buildings have similar CHW and HHW consumption levels. The energy balance load after the ELE increase was higher than expected range by approximately 120 Btu/day/ft^2. The increase of the ELE use in Biological Sciences Building – East after 1/2/2013 was questionable and this meter needs attention.

Explanatory Figure: 13 months energy balance plot with original data



Evans Library (TAMU BLDG # 468)

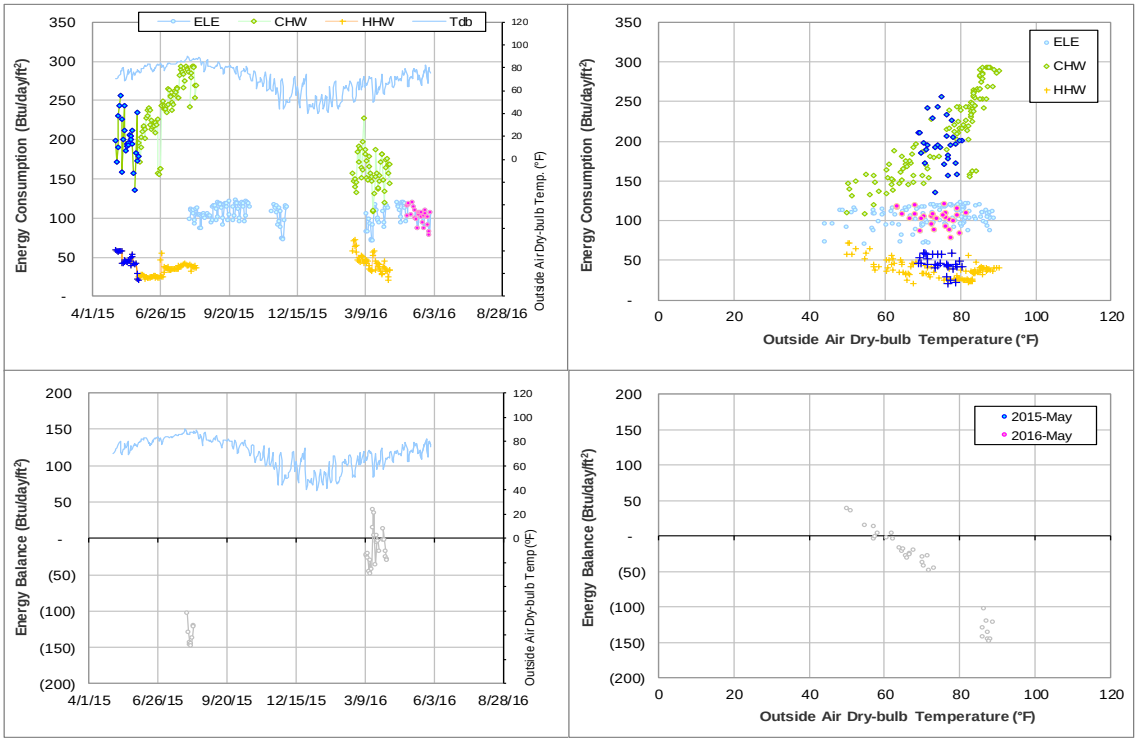
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
Energy Balance	The cross-point temperature was low.	2/23/2016–ongoing
CHW and HHW	The consumption level was lower than the same period of last year.	2/23/2016–ongoing

Comments

CHW includes 4 meters and HHW includes 5 meters. For years, the meters reading consumption varied year by year, but the total CHW or HHW use followed reasonable trends. After about 6 months (8/11/2015 – 2/22/2016) of missing data for one CHW meter (Meter ID 003903) and one HHW meter (Meter ID 003907), both total CHW and total HHW consumption was about 30 Btu/day/ft^2 lower than the same period of last year. The energy balance decreased gradually for years, and it was a little low after 2/23/2016 with the cross-point temperature around 60°F.

Explanatory Figure: 13 months energy balance plot with original data



Pavilion (TAMU Bldg #471)

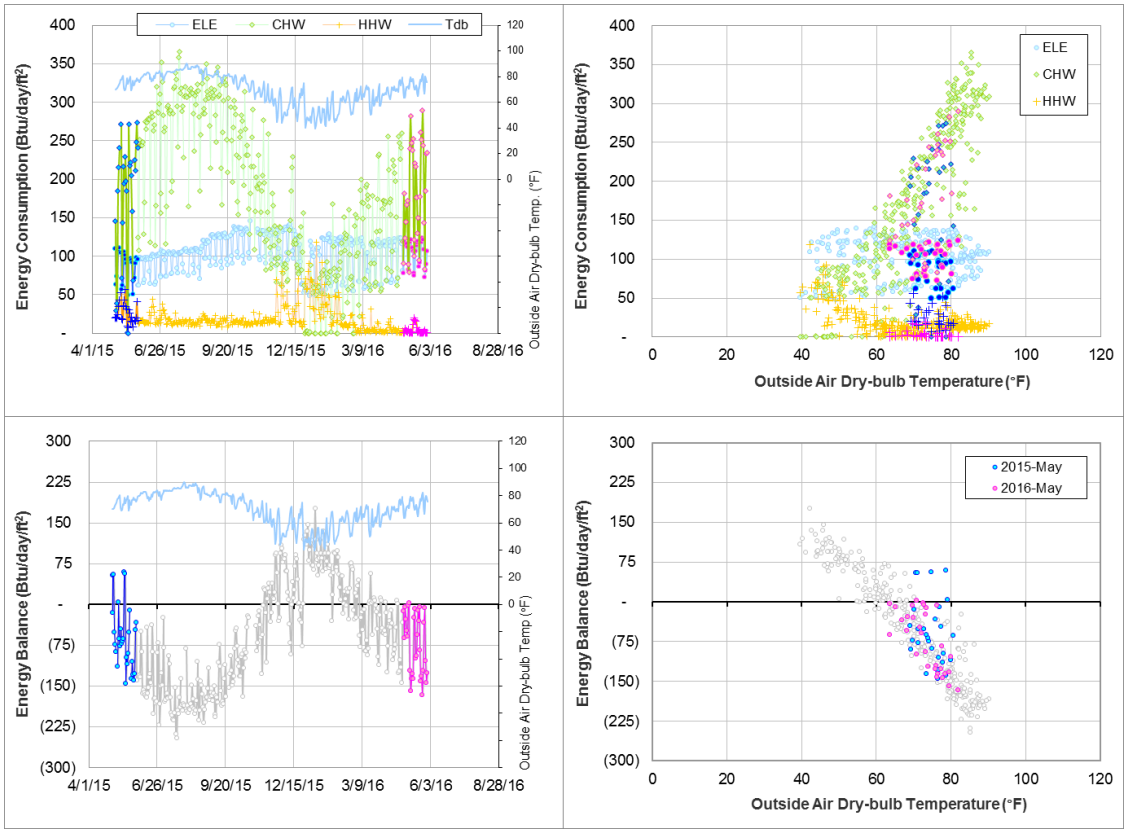
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	Drop in HHW flow.	3/2/2016 – ongoing

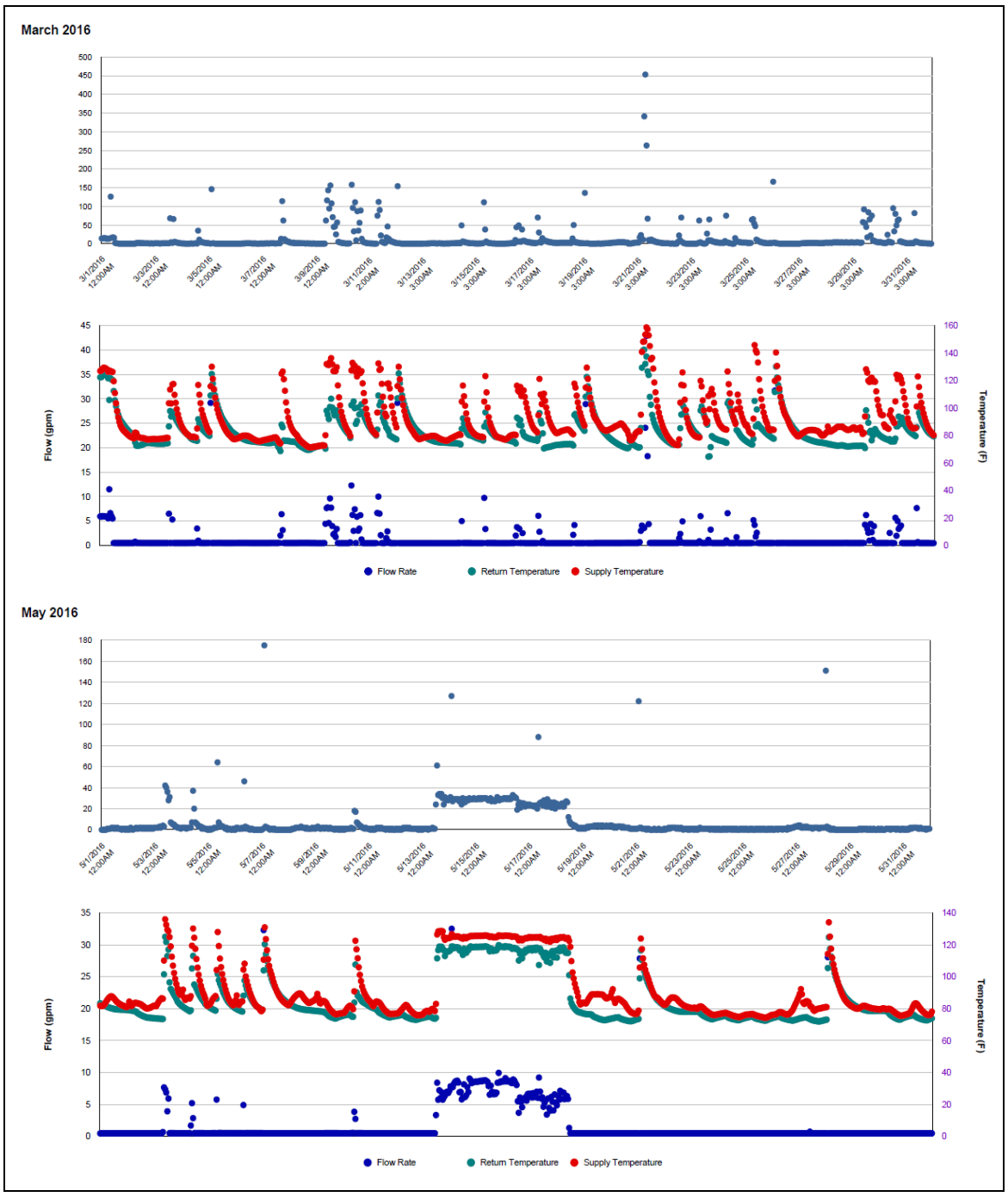
Quantitative descriptions and comments

Prior to March 2016, the HHW minimum flow ranged around 6 gpm. Starting March 2, 2016 the HHW minimum flow dropped to around 0 gpm.

Explanatory Figure: 13 months energy balance plot with original data.



Explanatory Figure: Time series plots of hourly HHW energy consumption, flow rate, and supply and return temperatures from the utilities office for March 2016 (above) and May 2016 (below). The March plot shows the drop in flow around the 2nd.



Scoates Hall (TAMU Bldg #478)

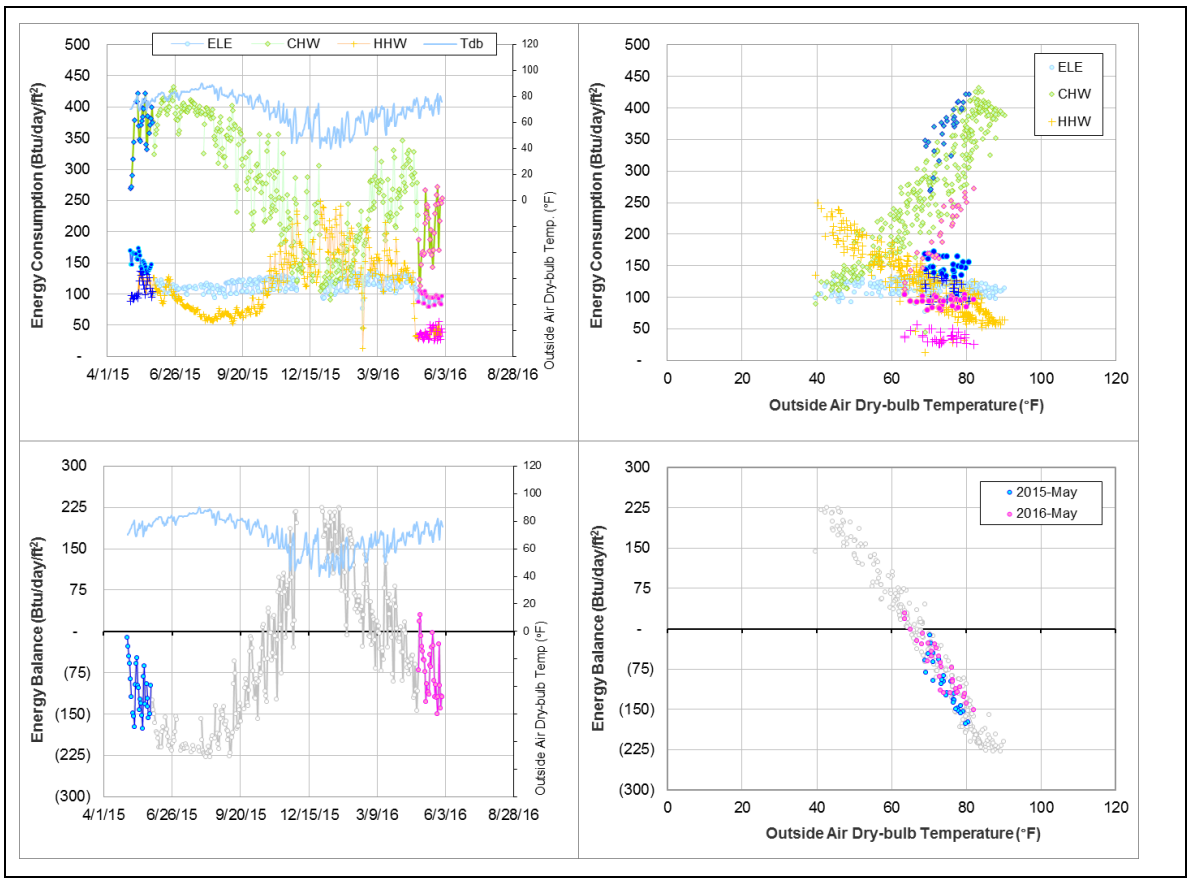
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE, CHW, and HHW	The consumption level has significantly decreased.	4/26/2016 – on going

Quantitative descriptions and comments

ELE, CHW, and HHW all saw a significant decrease in consumption starting since 4/26/2016. Since the energy balance plot has retained its pattern, the drop may be due to a decrease in usage that is associated with the end of the spring semester.

Explanatory Figure: 13 months energy balance plot with original data.



Utilities & Energy Services Central Office (TAMU Bldg #496)

Detected issues in the energy balance and/or the consumption data

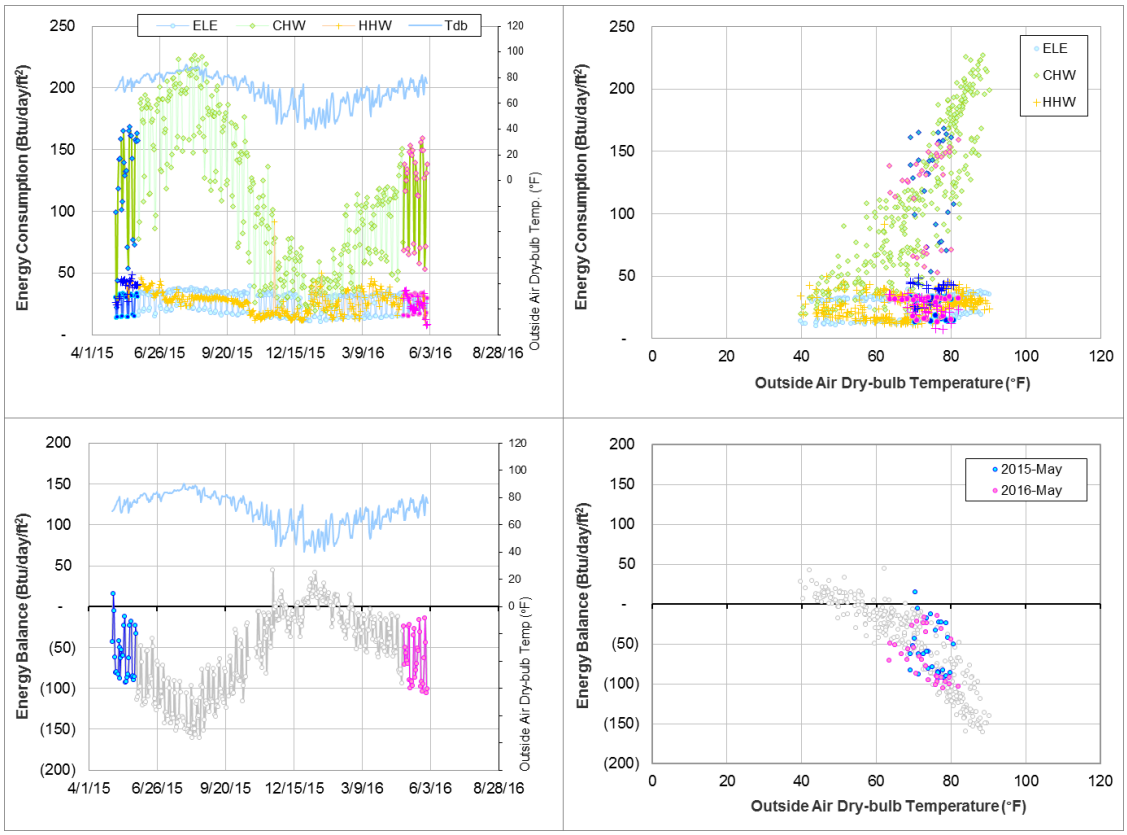
Data Type	Description of data behaviors	Period
ELE, CHW, and HHW	The energy use per unit floor area was low compared to other buildings.	Since the data became available on 7/1/2012

Quantitative descriptions and comments

The peak electricity use density was around 0.65 W/ft^2 which is small compared to that of other office buildings on campus. The delta T for HHW seemed to be small for years. The CHW and HHW consumption per the unit floor area also seemed to be low. It is possible that the GSF we have (46,110 ft^2) includes substantial unoccupied space.

The energy balance was scattered due to the consumption level changes for CHW and HHW, the cross-point temperature of the energy balance was ranged around 50 to 70°F.

Explanatory Figure: 13 months energy balance plot with original data.



Engineering Innovation Center (TAMU Bldg # 499)

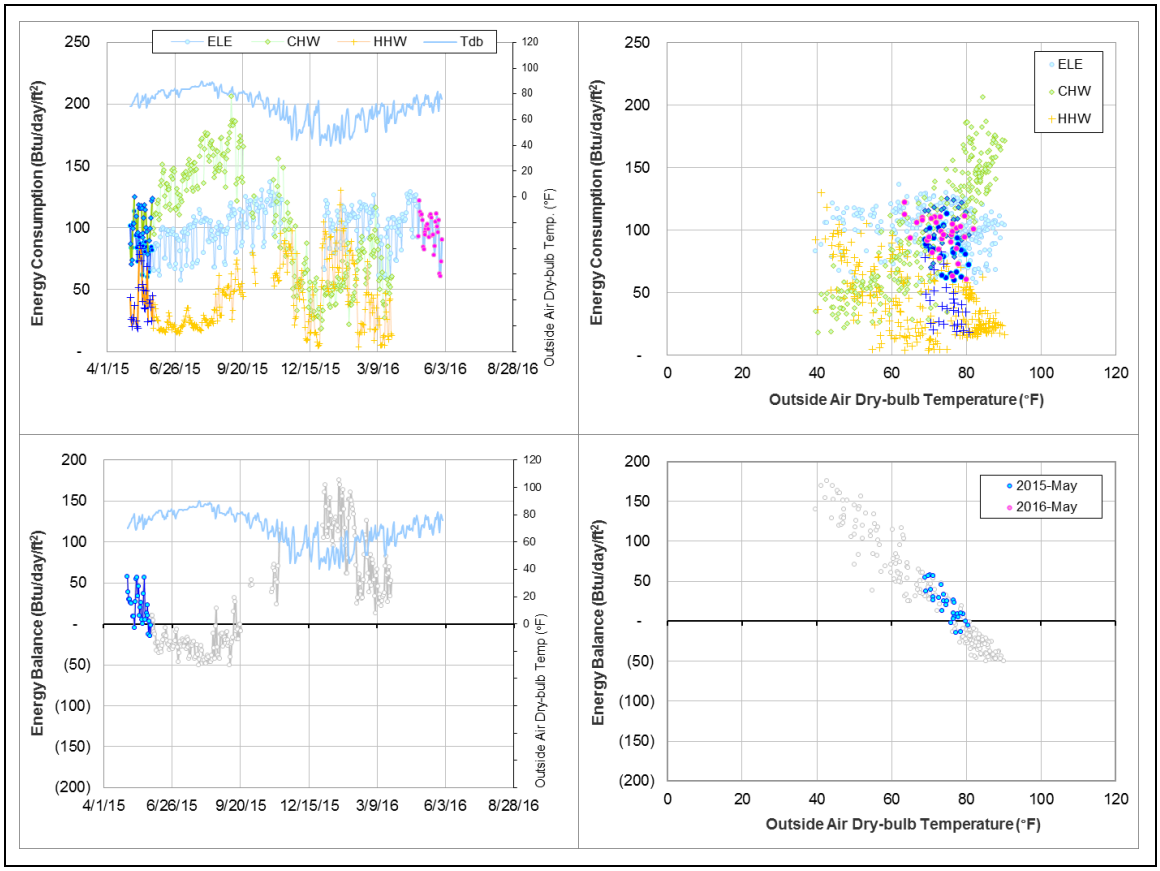
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
Energy Balance	The cross-point temperature is high.	For years
CHW	The consumption level is low compared to the ELE and HHW consumption.	For years
HHW	The consumption was lower than the same period of last year.	Since December 2015

Comments

The cross-point temperature of the energy balance is around 80°F. The CHW consumption is relatively low and its delta T is always small. The HHW consumption since December 2015 is much lower than the same month of last year (about 100 Btu/day/ft^2 lower).

Explanatory Figure: 13 months energy balance plot with original data. CHW and HHW data is not available for the months of April and May and do not appear in the below plots.



Nagle Hall (TAMU Bldg #506)

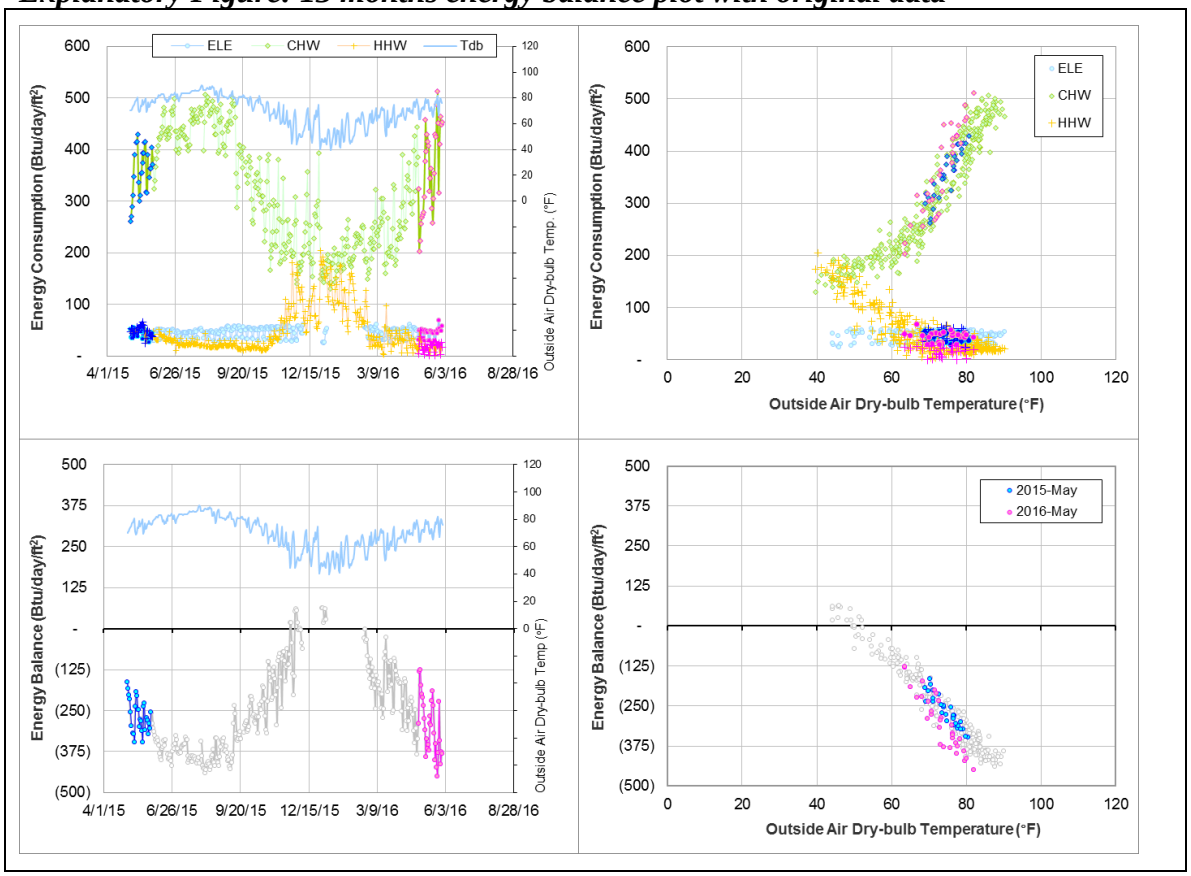
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
Energy Balance	The level was low and the cross-point temperature was around 50°F.	The cross-point temperature has always been low.
ELE	The consumption per unit floor area was smaller than those for other office buildings.	The level was always low and gradually decreased over the past 4 years.

Comments

The ELE consumption was about 100 Btu/day/ft^2 lower than the levels in typical office buildings on campus, and this might be a metering error or this meter might not cover the whole building.

Explanatory Figure: 13 months energy balance plot with original data



Blocker Building (TAMU Bldg #524)

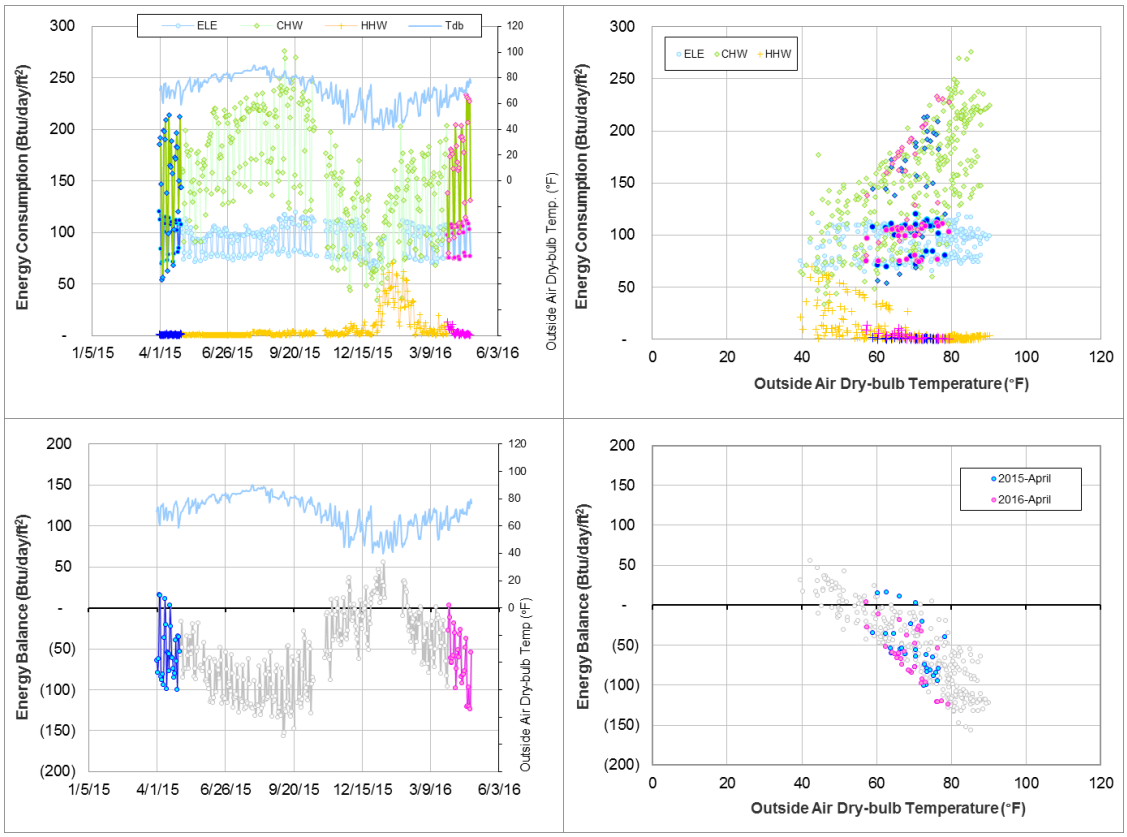
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
HHW	The consumption level might be low.	Past several years

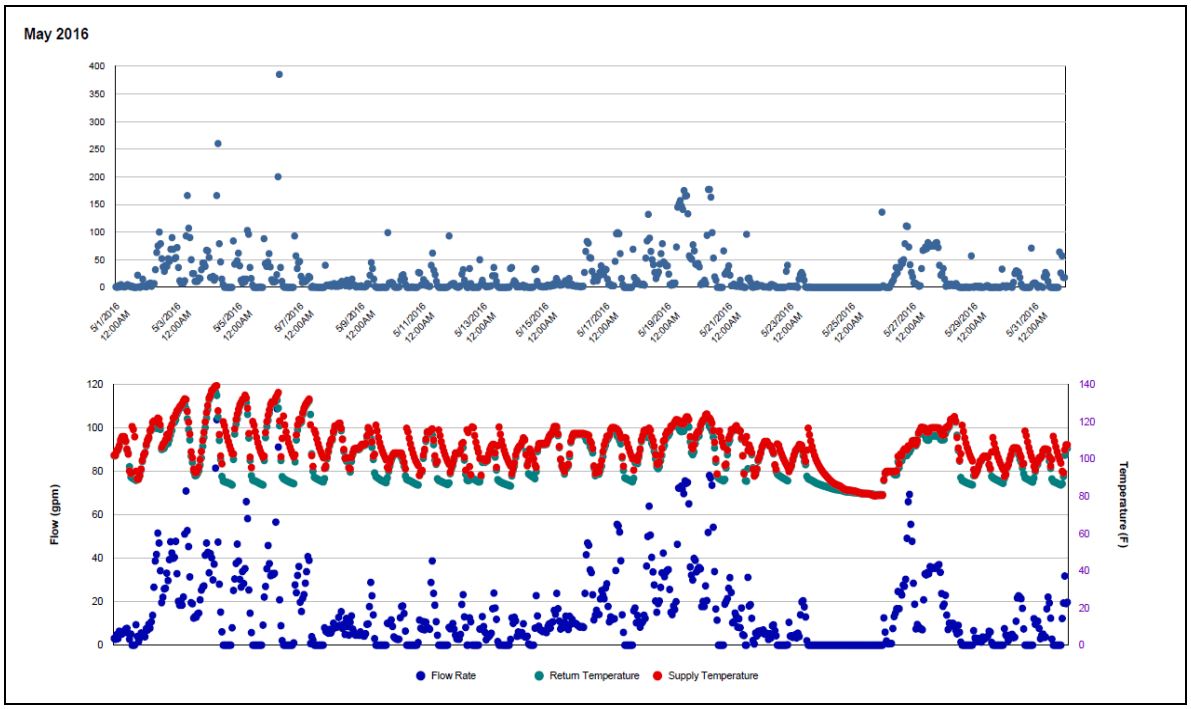
Quantitative descriptions and comments

The delta T and consumption level for HHW seems low for the past couple of years.

Explanatory Figure: 13 months energy balance plot with original data



Explanatory Figure: Time series plots of hourly HHW energy consumption, flow rate, and supply and return temperatures from the utilities office. (May 2016)



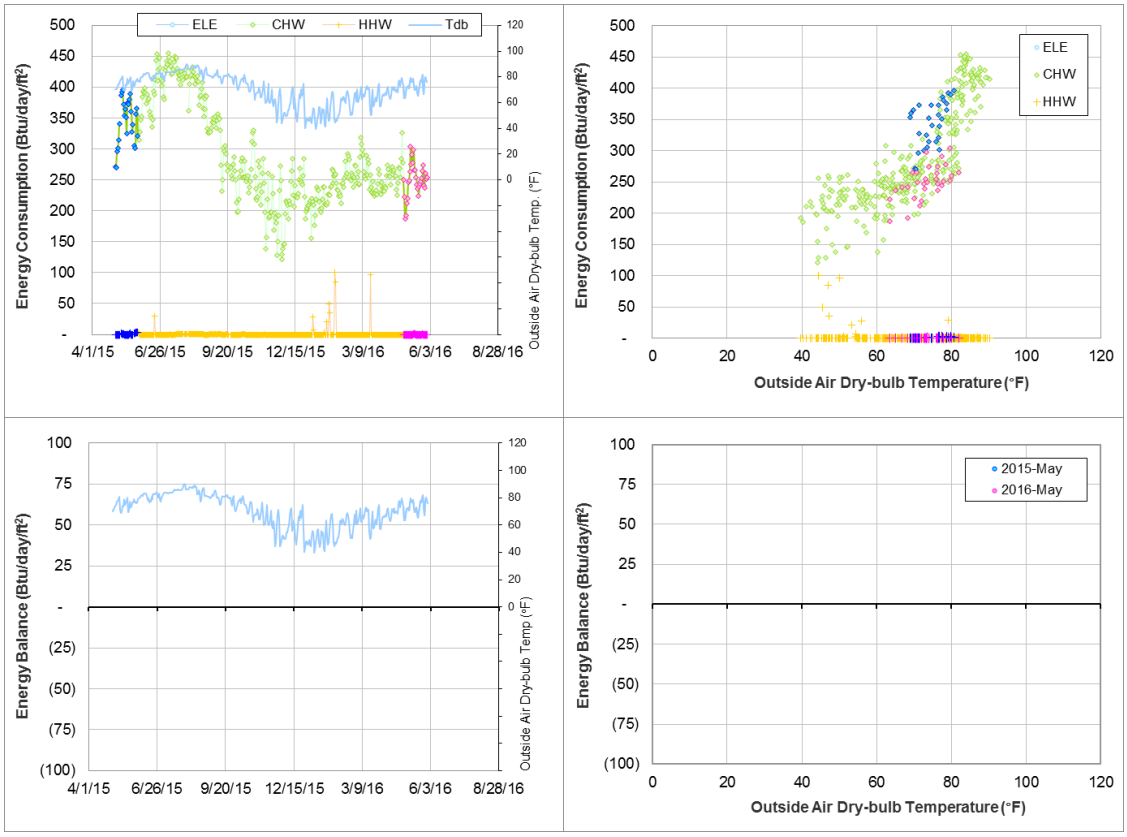
TVMC-Small Animal Building (TAMU Bldg# 880)

Data Type	Description of data behaviors	Period
HHW	The daily consumption is zero or nearly zero for the majority of the days during the year.	Since the data became available in October 2008

Comments

The daily HHW consumption pattern is zero or nearly zero for the majority of the days for years. Because the HHW consumption level appears unstable since the data became available, a valid consumption model for this meter has not been created.

Explanatory Figure: 13 months energy balance plot with original data



Veterinary Medicine Administration (TAMU Bldg# 1026)

Detected issues in the energy balance and/or the consumption data

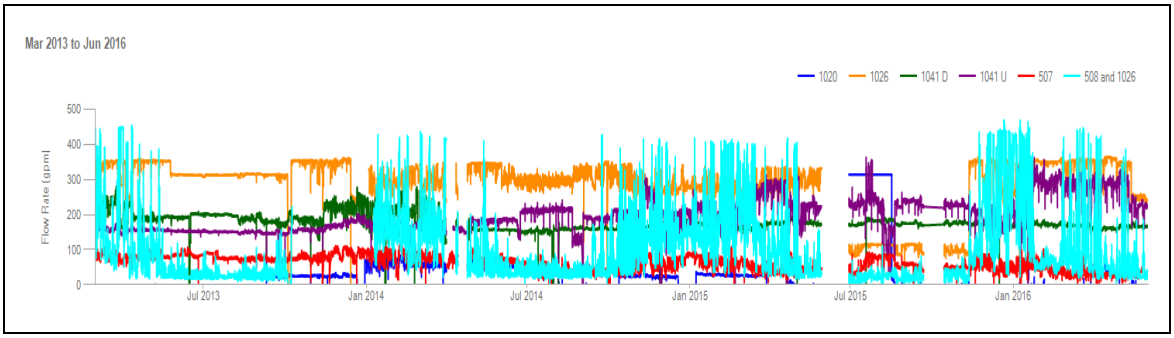
Data Type	Description of data behaviors	Period
HHW 006053	The sub-meter's (006053) flow rate for one building sometimes is higher than the total meter (004170) for two buildings.	For several years

Comments

The HHW meter ID 006053 is a sub-meter of the meter ID 004170 which meters the total energy use in the buildings #508 and #1026. It is questionable that the flow rate of the sub-meter exceeds the flow rate of the main meter. We would like to know the HHW distribution route for the two buildings and the locations of the sensors.

ESL has not received the consumption data for the HHW meter since 10/21/2012.

Explanatory Figure: Time series of hourly HHW flow rates for Veterinary Medicine Administration (Bldg #1026) and neighboring buildings during 3/1/2015–6/1/2016. The combined HHW metered for Bldg #1026 and #508 (light blue) is lower than the standalone HHW meter for only Bldg #1026 (dark blue).



Biological Control Facility (TAMU Bldg# 1146)

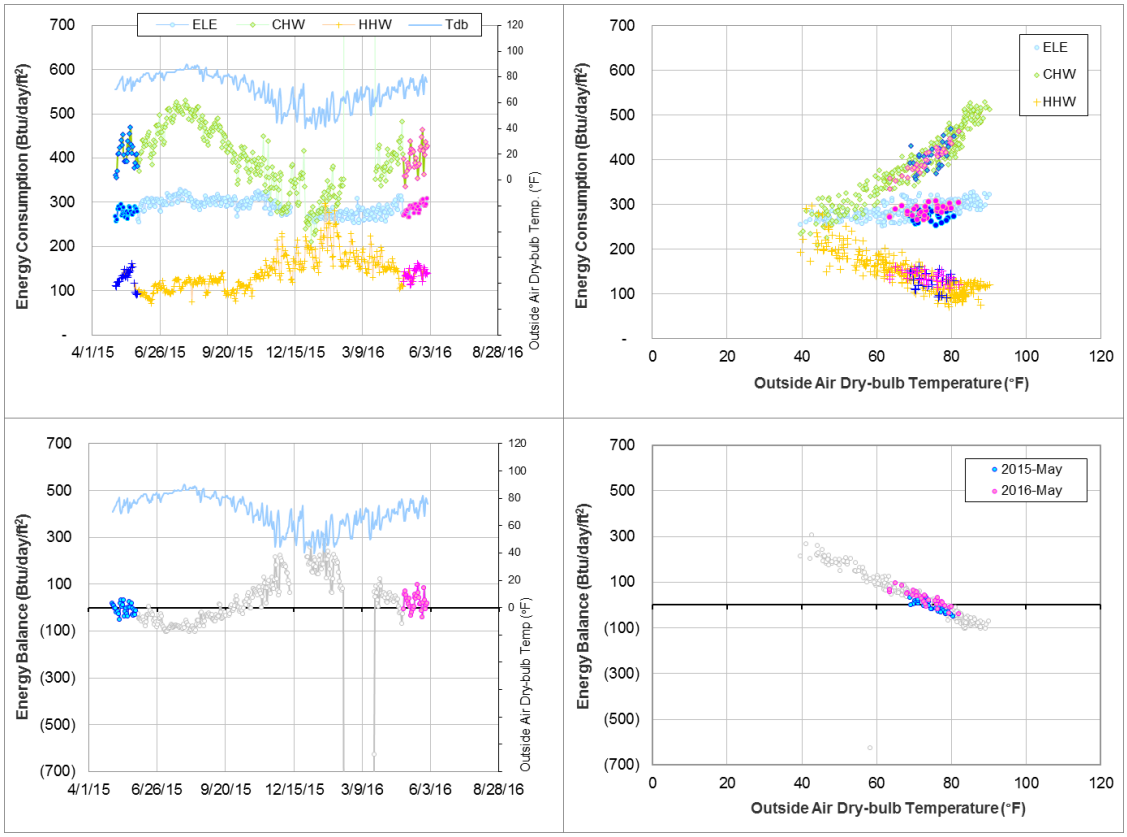
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
Energy Balance	The cross-point temperature is slightly high, ~75°F.	12/28/2014-ongoing
ELE	The consumption increased gradually.	For several years

Comments

The electricity consumption increased gradually over several years. As a result, the energy balance pattern changed and the cross-point temperature shifted slightly higher from approximately 70˚F to 75˚F.

Explanatory Figure: 13 months energy balance plot with original data



Physical Plant Administration & Shops (TAMU Bldg# 1156)

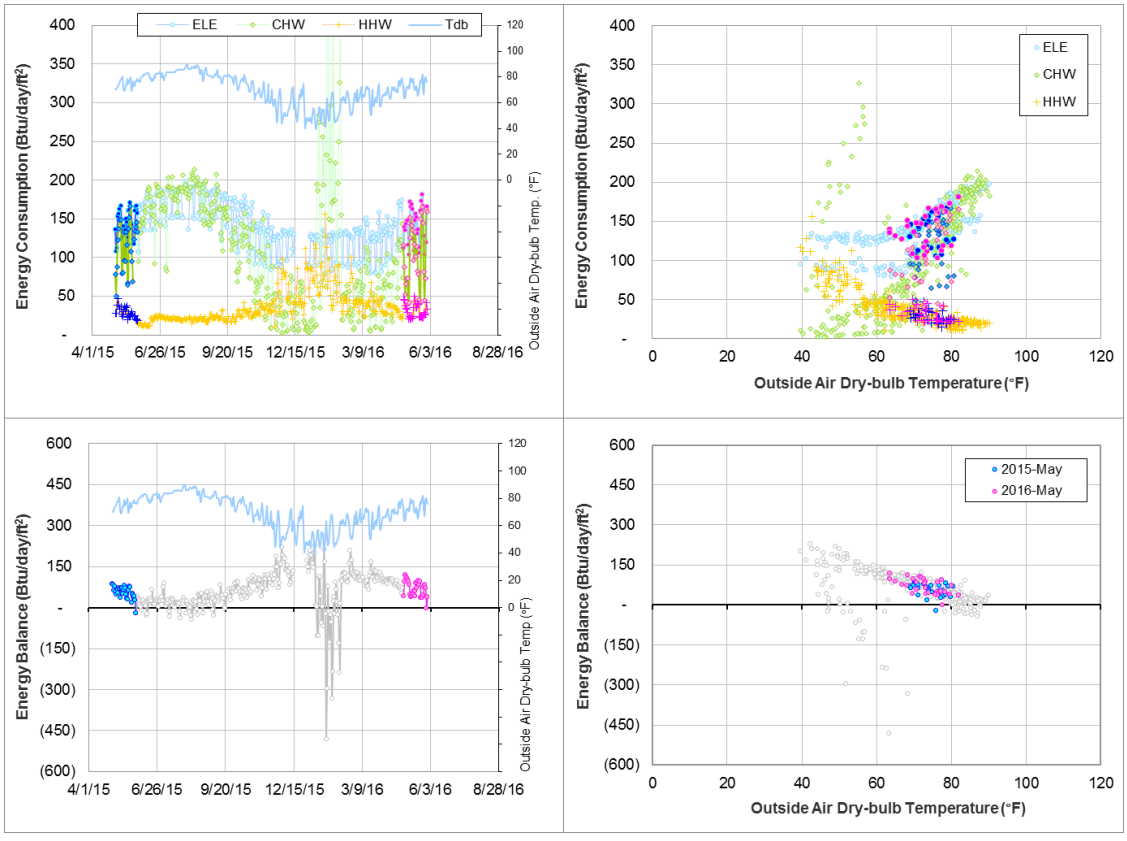
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
Energy Balance	The cross-point temperature is high, ~85˚F.	7/1/2014-ongoing
CHW	The consumption level might be low compared to the ELE and HHW use level.	Since the data became available on 7/1/2012.

Comments

The electricity is not available until 7/1/2014. CHW consumption level might be low compared to the ELE and HHW use level. But the CHW consumption level has been stable since the data became available on 7/1/2012. More information might be needed to help identify which type energy causes the high cross-point temperature.

Explanatory Figure: 13 months energy balance plot with original data



Veterinary Research Building (TAMU Bldg# 1197)

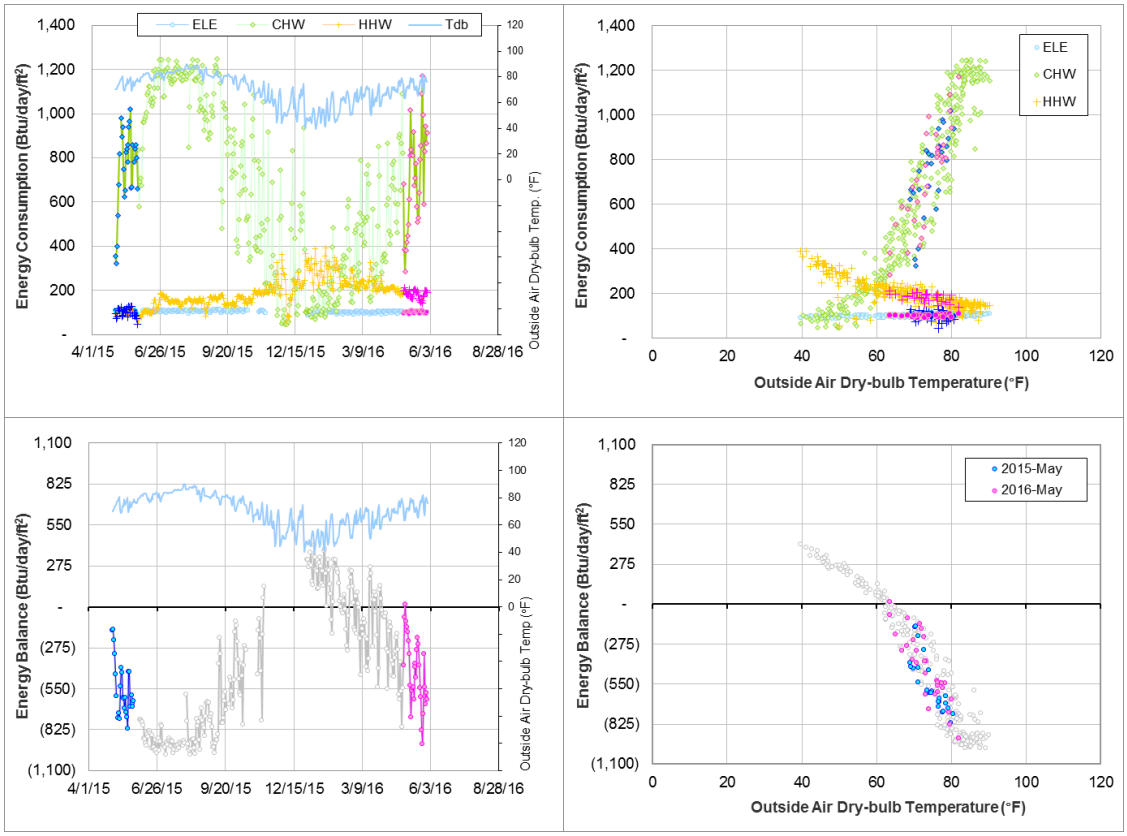
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE	The consumption is low for a laboratory building.	Since January 2010 when the meter was added to this report

Comments

The whole building hourly electricity use is in the range 130 kWh to 180 kWh (1.13 W/ft^2 to 1.57 W/ft^2), which is low for a veterinary laboratory building on the campus. This seems to be the reason for the low level of the energy balance load. The temperature-axis intercept of the energy balance is around 62°F.

Explanatory Figure: 13 months energy balance plot with original data



Kleberg Center (TAMU Bldg #1501)

Detected issues in the energy balance and/or the consumption data

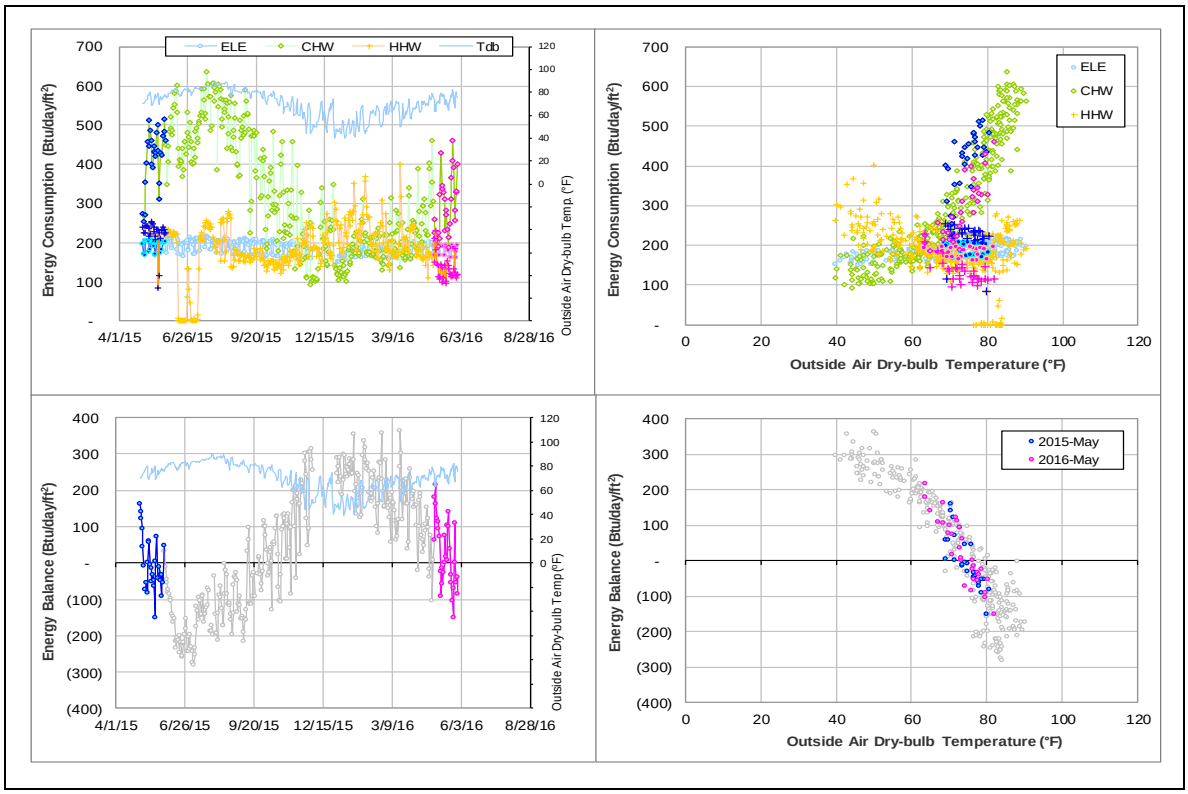
Data Type	Description of data behaviors	Period
CHW	The return temperatures is high. Delta-T is bigger than that for similar buildings in campus.	Since we started to analysis this building in 2006.

Comments

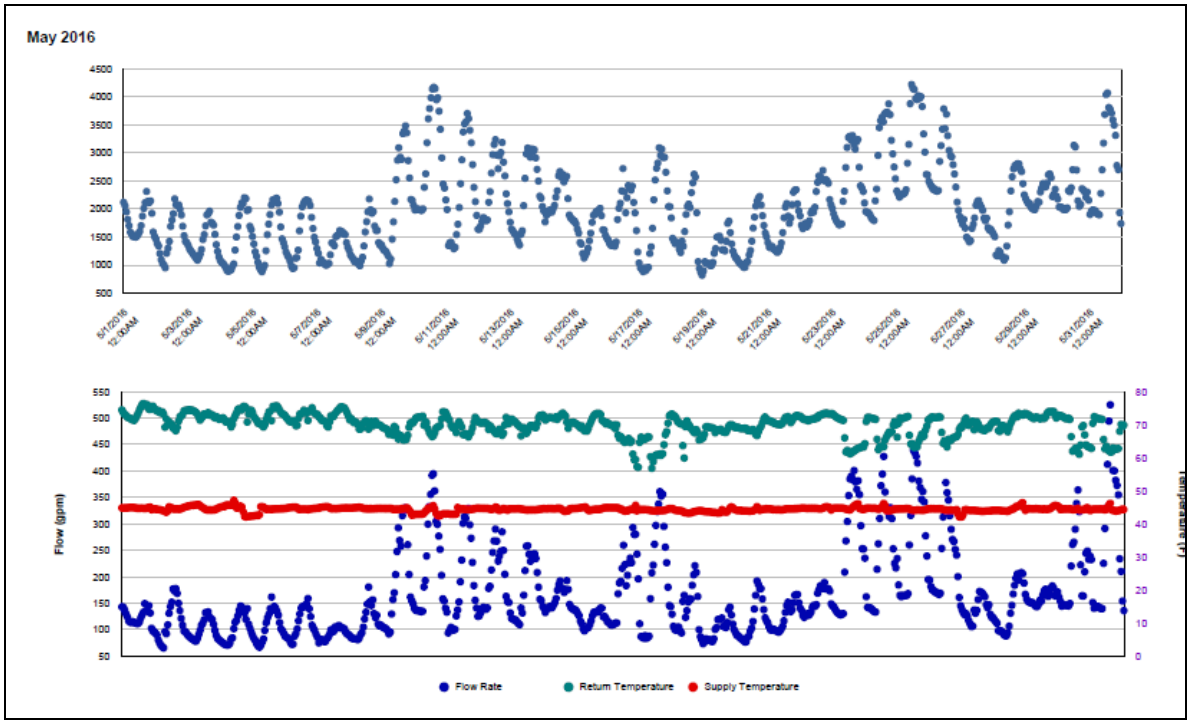
The return temperature for CHW meter was high, about 60 - 70°F for years. The return temperature increased further on 11/13/2014 and it reached 80°F sometimes. Delta-T for this building (25 - 35°F) is much bigger than that for similar buildings in campus. It is suggested to investigate the temperature sensor for CHW meter.

The ESCO period for this building is 5/1/2011-1/1/2012. The CHW consumption level has been stable for over three years after ESCO period.

Explanatory Figure: 13 months energy balance plot with original data



Explanatory Figure: Time series plots of hourly energy consumption, flow rate, and supply and return temperatures from the utilities office (CHW during May 2016)



West Campus Parking Garage (TAMU Bldg #1559)

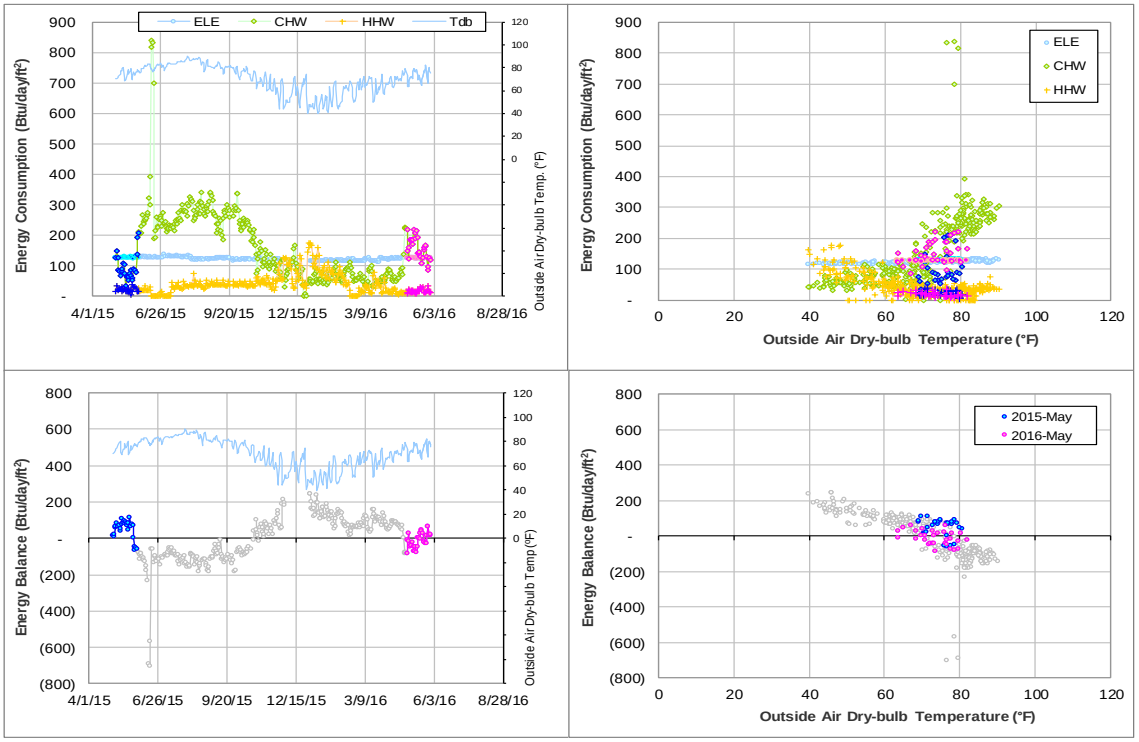
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
CHW	The consumption level decreased largely. The scattering data was observed.	October 2013 - ongoing
	The consumption level increased. The scattering data was observed.	5/28/2015 - ongoing

Comments

The CHW consumption level decreased from 800 Btu/day/ft^2 to 100 Btu/day/ft^2 since October 2013 mainly caused by a decrease in the flow rate. The consumption pattern was very scattering and the cross-point temperature is high, 75-85˚F, after this decrease. The CHW consumption increased at the end of May 2015 which causing the cross-point shift to more reasonable range. We need more data to verify this trend. But the consumption pattern is still very scattering.

Explanatory Figure: 13 months energy balance plot with original data



International Ocean Discovery Building (TAMU Bldg #1601)

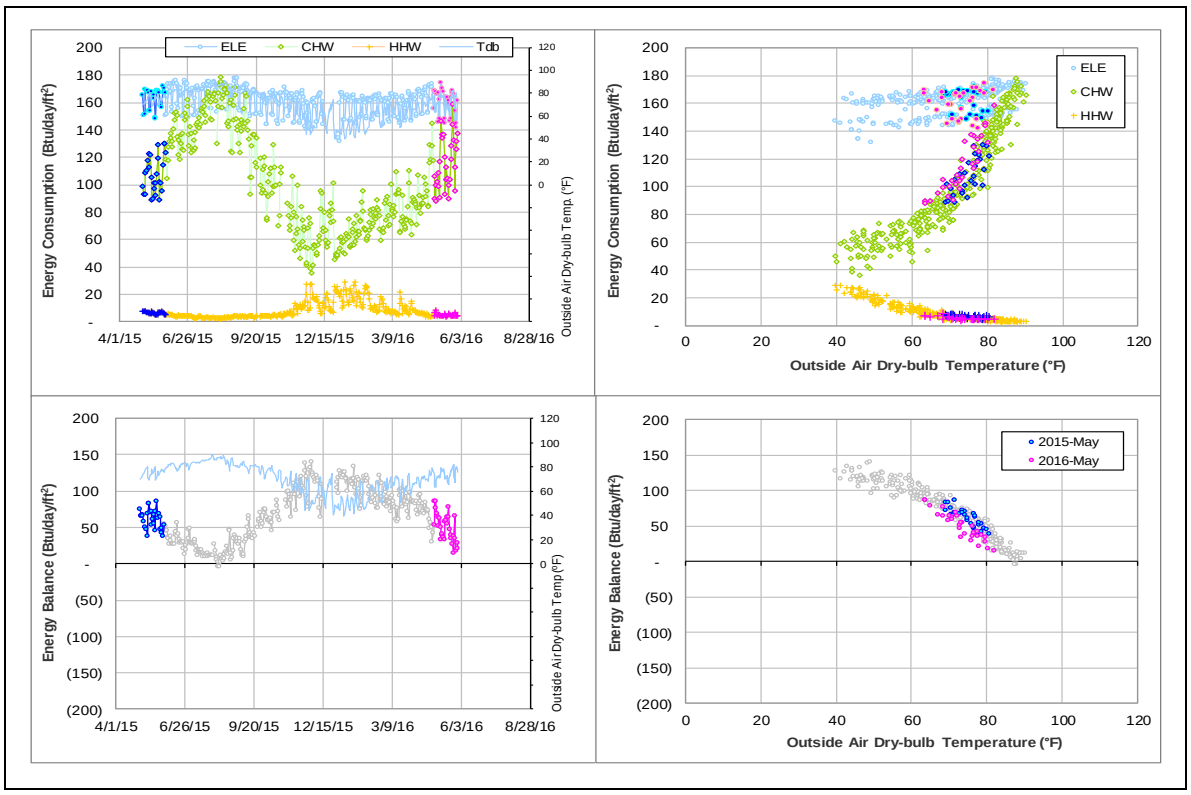
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
Energy Balance	The cross-point is high, around 88 °F.	Since data became available in Feb 2015

Comments

The cross-point temperature is high for this building, around 88°F. The daily CHW consumption for last year is 40 – 180 Btu/day/ft^2. The CHW consumption level is low compared to ELE and HHW levels. This building might have its chillers.

Explanatory Figure: 13 months energy balance plot with original data



Offshore Technology Research Center (TAMU Bldg #1604)

Detected issues in the energy balance and/or the consumption data

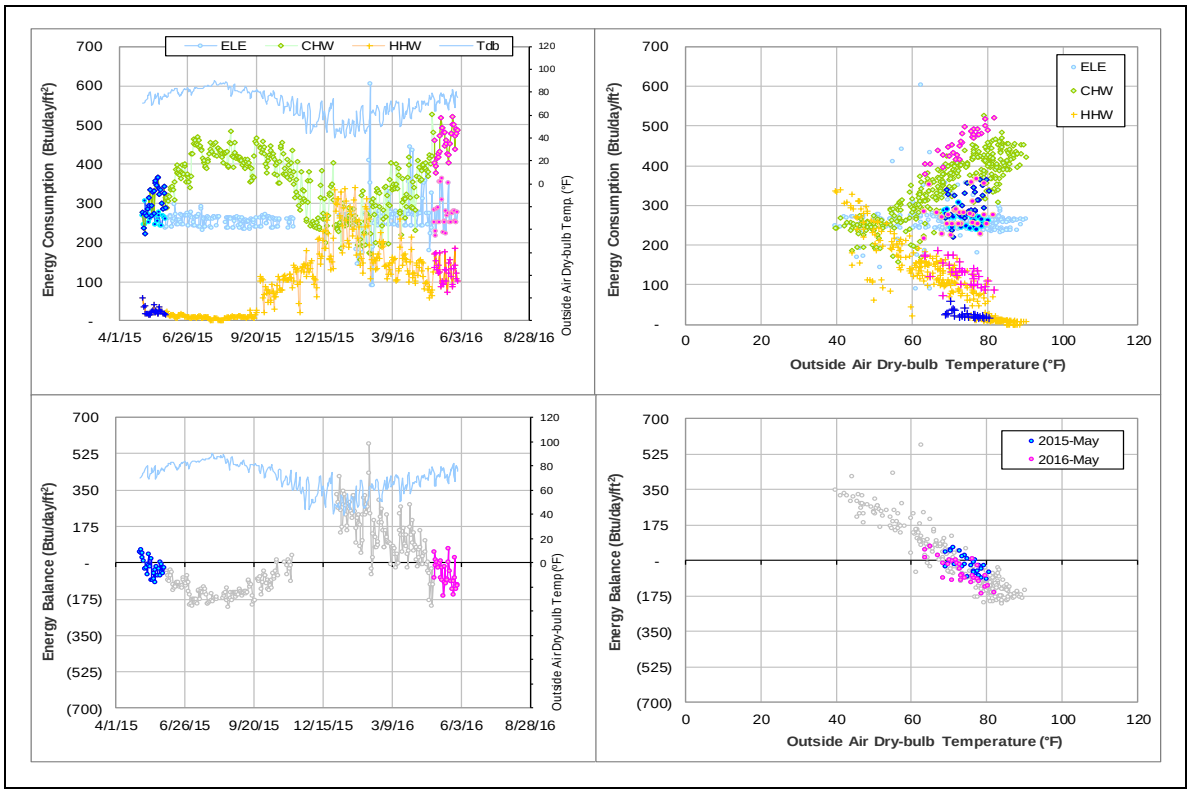
Data Type	Description of data behaviors	Period
ELE (006660)	The daily consumption was recorded as zero for the majority of the days.	Since data became available in Feb 2015
CHW and HHW	The consumption level is higher than that of last year.	5/1/2016-5/31/2016

Comments

Both CHW and HHW consumption level is higher than that of last year in this month.

There are two ELE meters (006659 and 006660). The daily consumption for MeterID 006660 was recorded as zero for the majority of the days since data became available in February 2015. The daily consumption for several days in recent several months increased largely and caused scattering energy balance.

Explanatory Figure: 13 months energy balance plot with original data



Engineering Research Building (TAMU Bldg #1611)

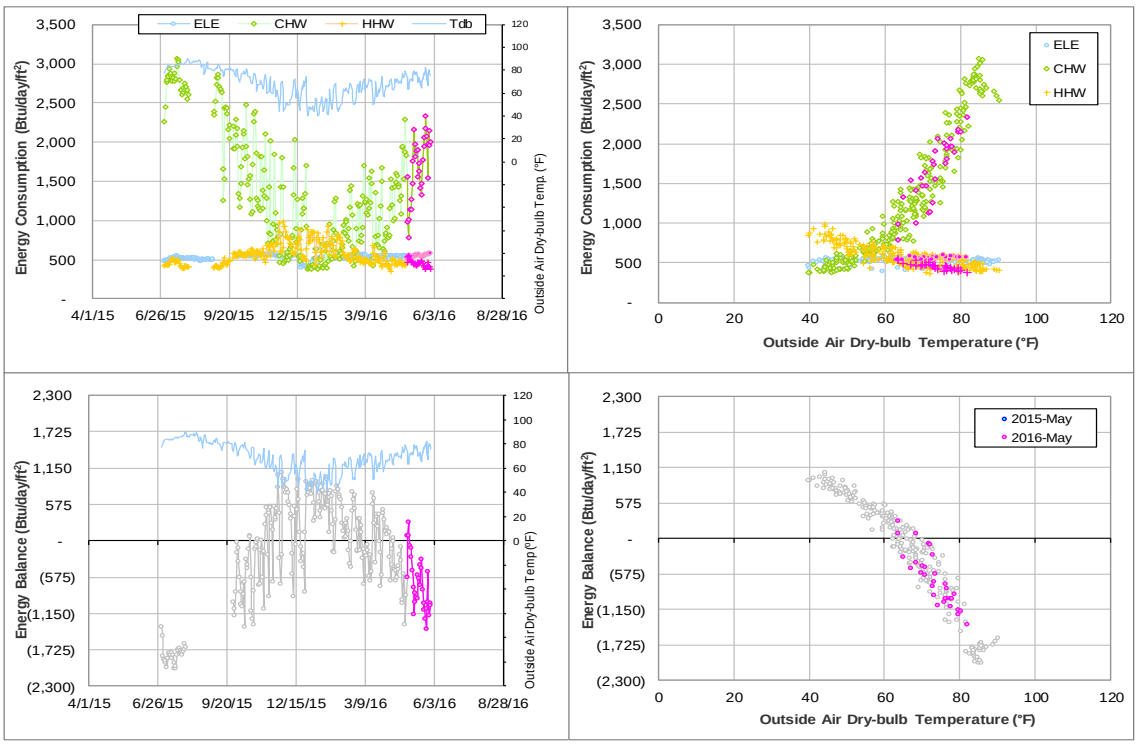
Detected issues in the energy balance and/or the consumption data

Data Type	Description of data behaviors	Period
ELE, CHW and HHW	The consumption levels are too high.	Since the data became available in July 2015

Comments

The energy data for this building just becomes available since July 2015. All consumption levels seem to be high. ELE: ~500 Btu/day/ft^2; CHW: 500 – 3100 Btu/day/ft^2; HHW: 400 - 1000 Btu/day/ft^2. However, the cross-point of temperature for energy balance load is in the reasonable range.

Explanatory Figure: 13 months energy balance plot with original data



III. Time Series Plots for May 2016 Consumption

Figure III-1 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Emerging Technologies Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

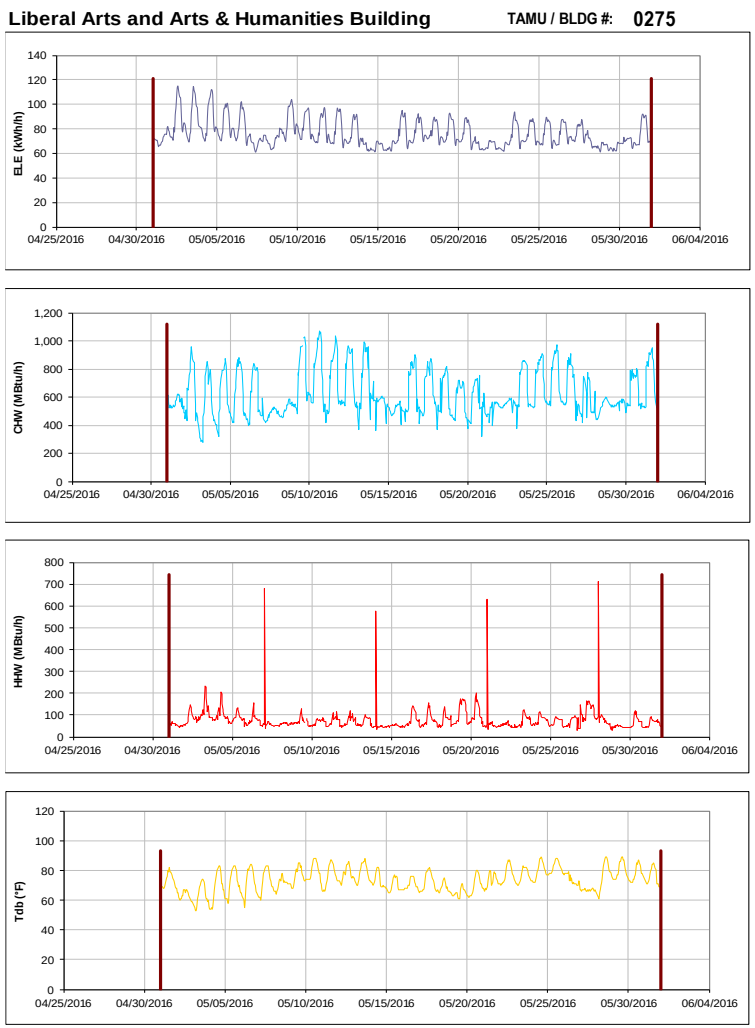


Figure III-2 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Liberal Arts and Arts & Humanities Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

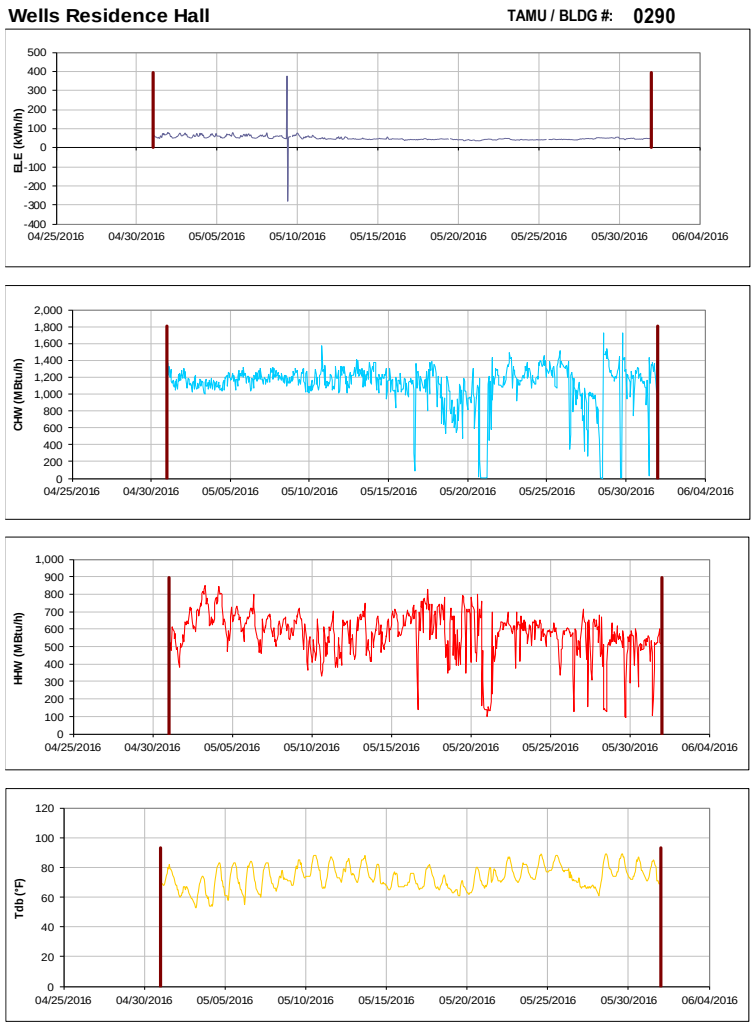


Figure III-3 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Wells Residence Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

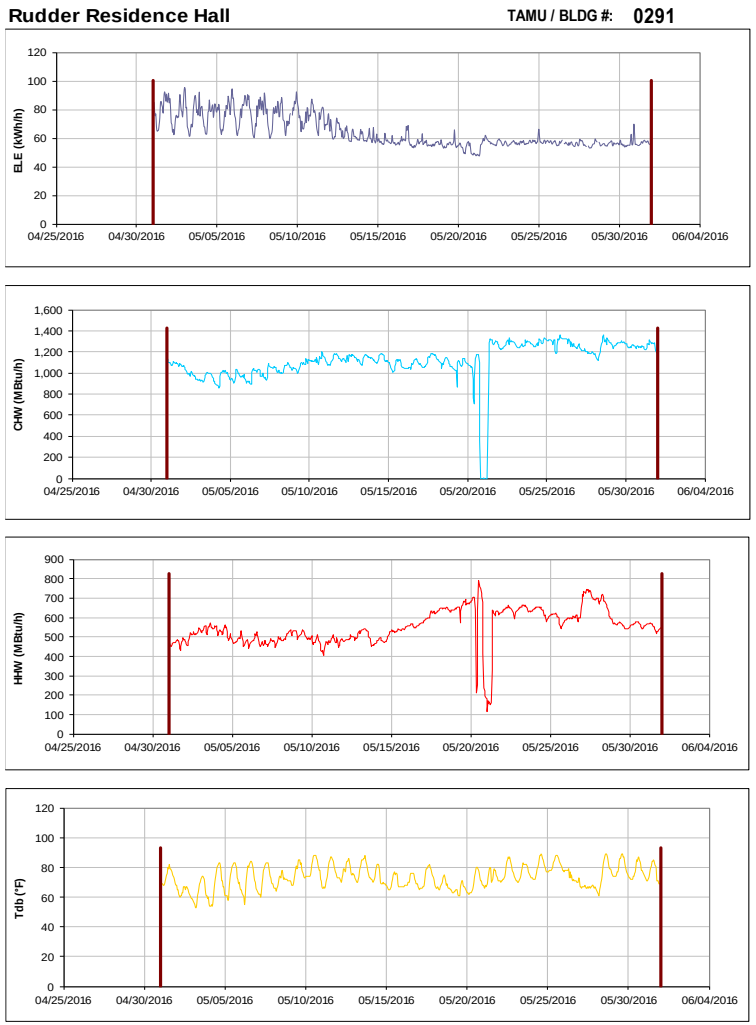


Figure III-4 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Rudder Residence Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

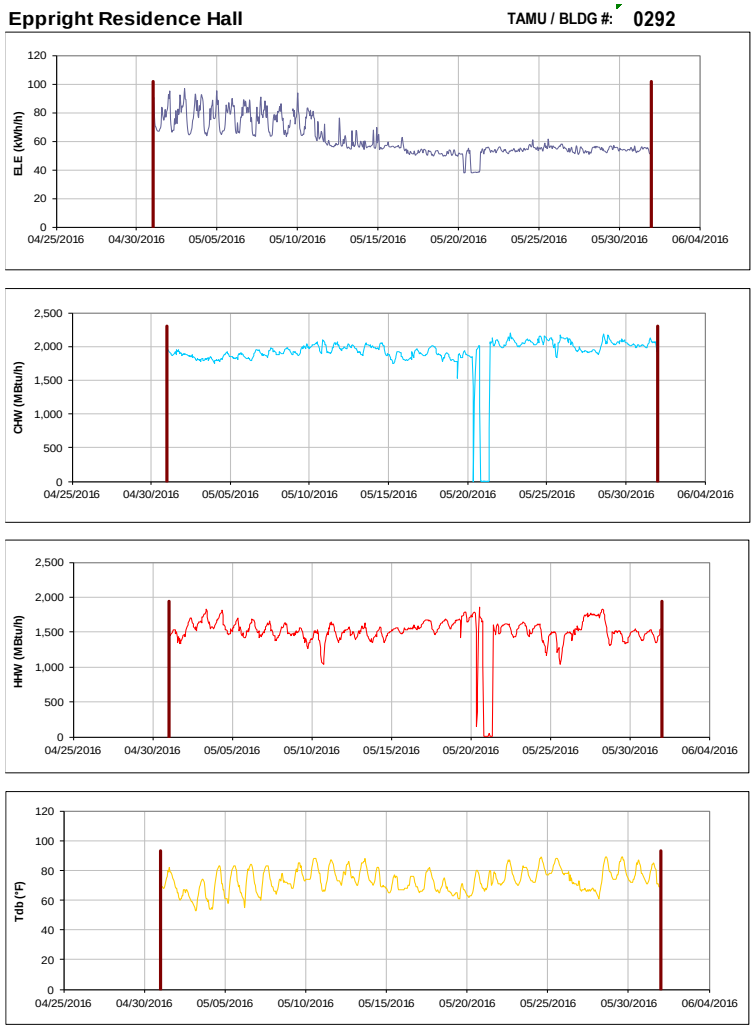


Figure III-5 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Eppright Residence Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

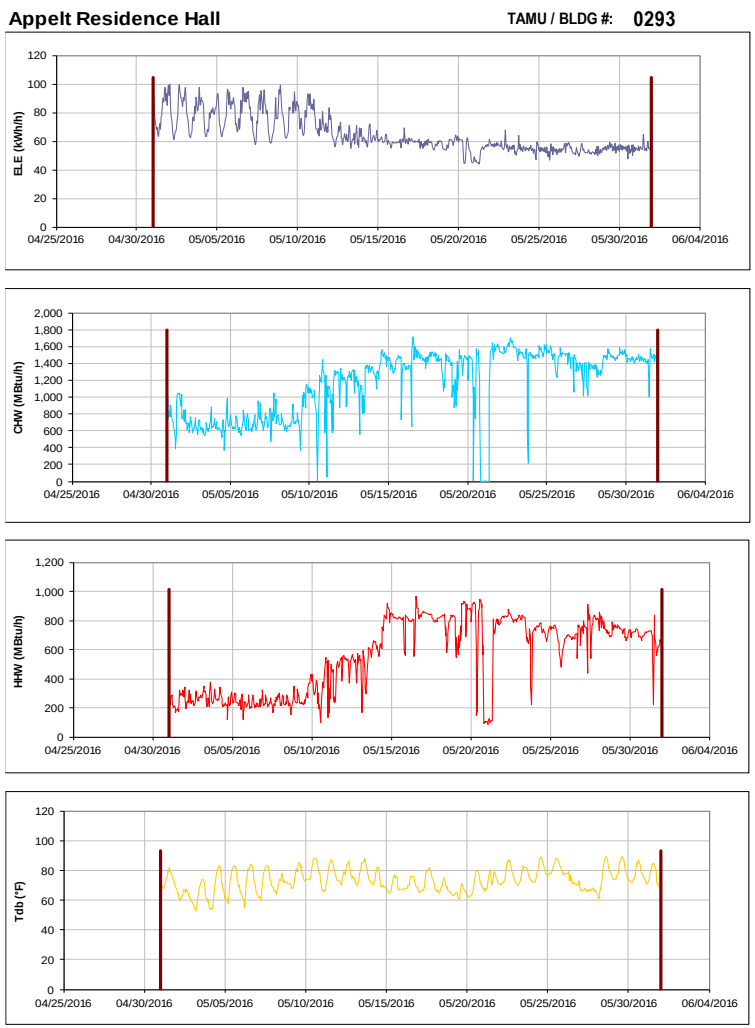


Figure III-6 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Appelt Residence Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

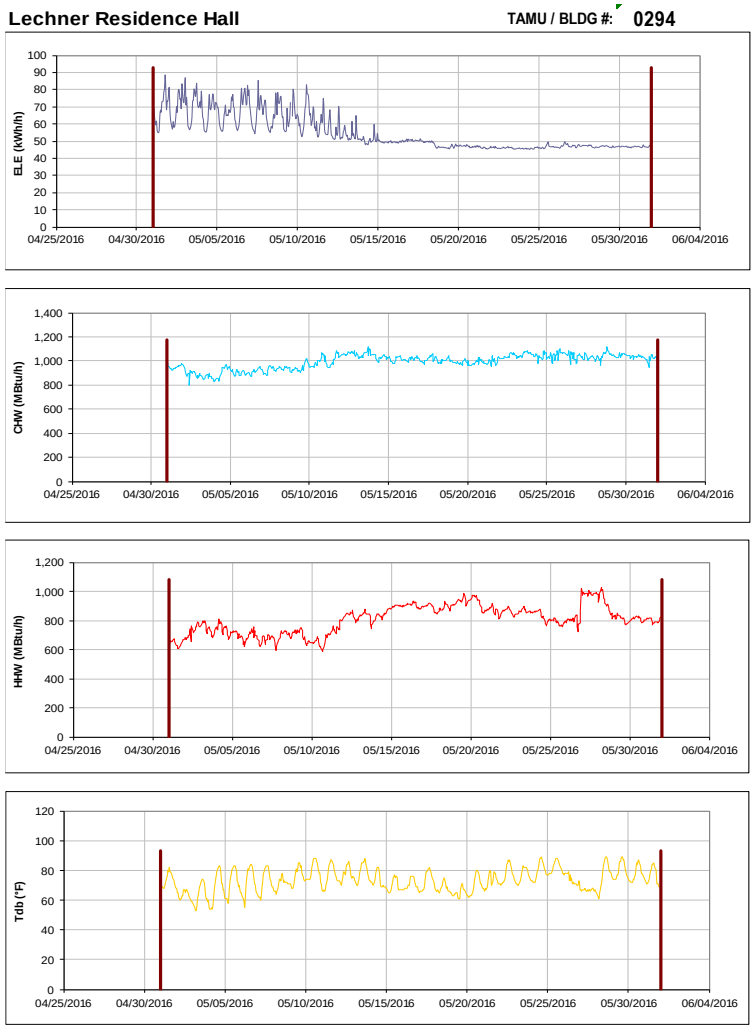


Figure III-7 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Lechner Residence Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-8 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Mitchell Inst. for Fundamental Phys & Astronomy during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-9 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for CE TTI Office & Lab Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

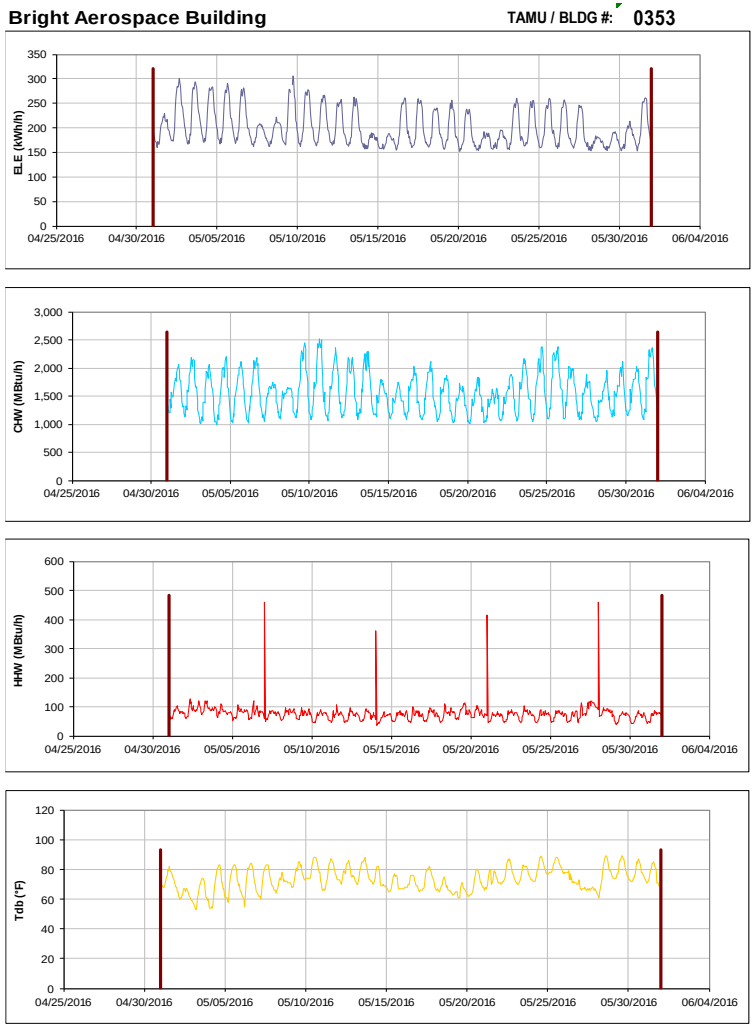


Figure III-10 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Bright Aerospace Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-11 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Davis Football Player Development Center during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

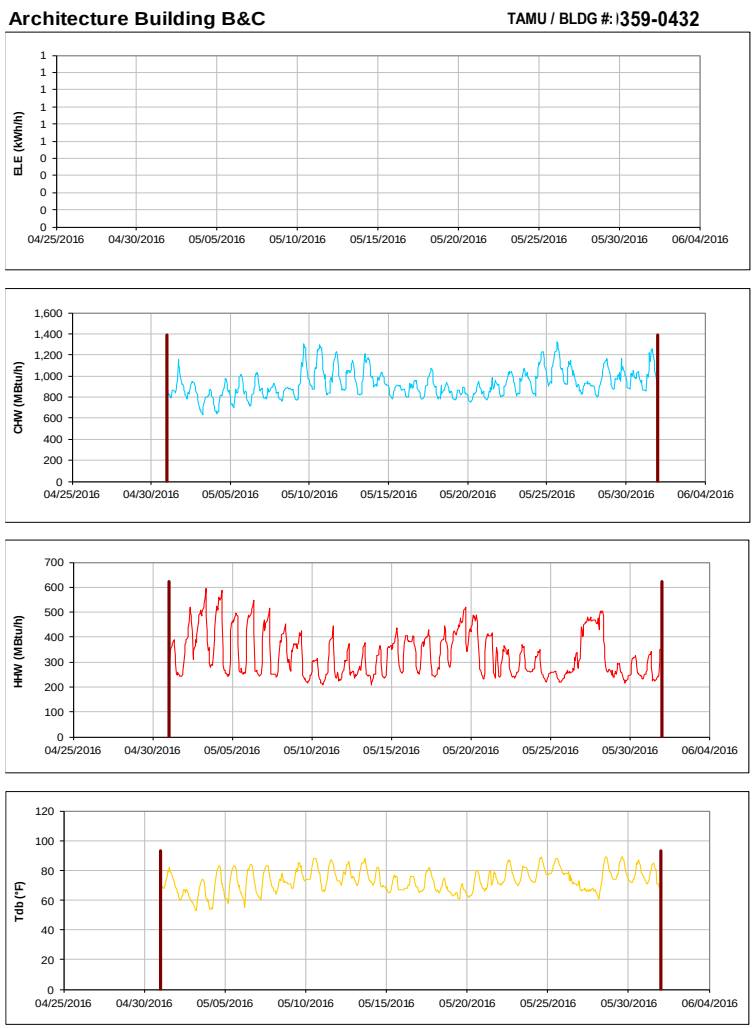


Figure III-12 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Architecture Building B&C during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

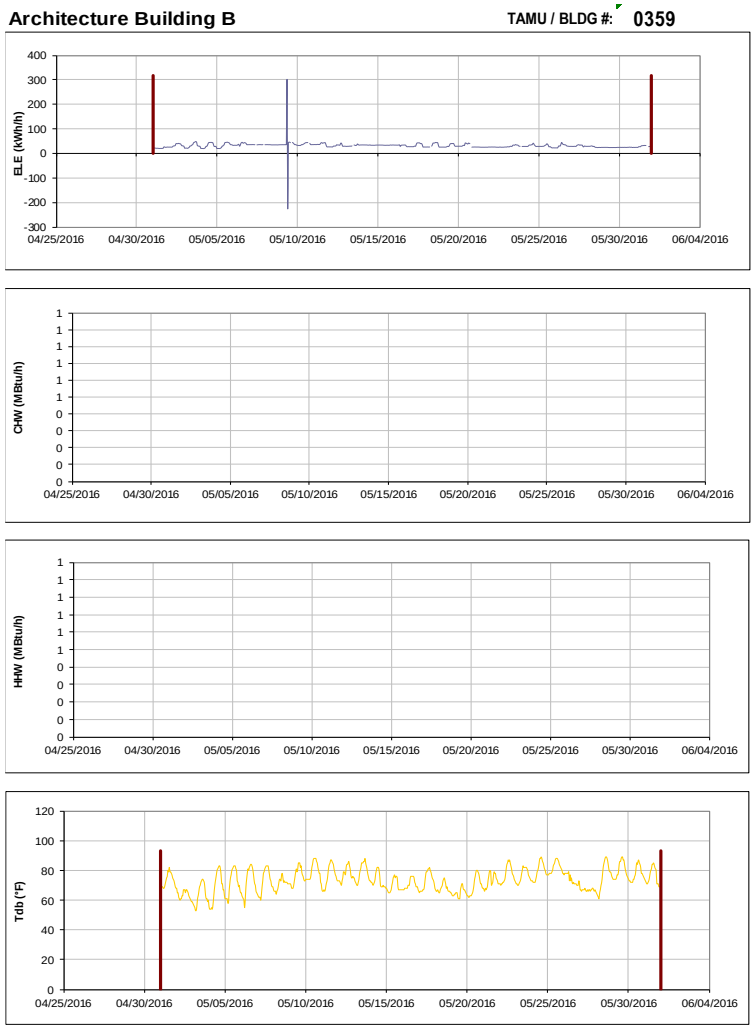


Figure III-13 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Architecture Building B during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

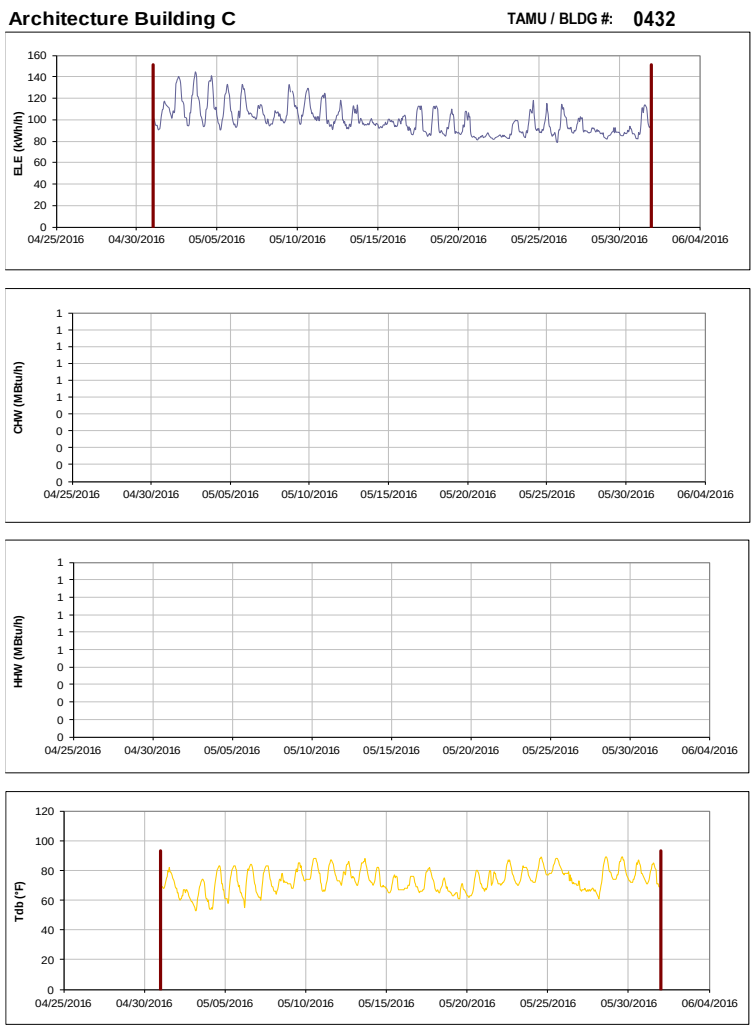


Figure III-14 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Architecture Building C during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

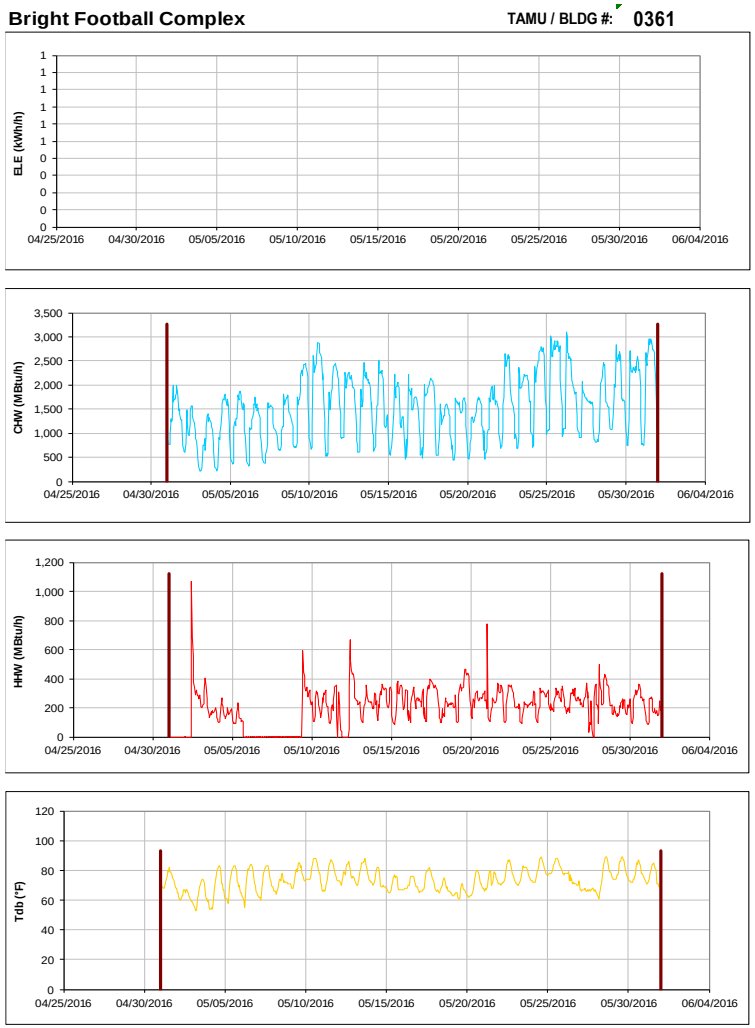


Figure III-15 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Bright Football Complex during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

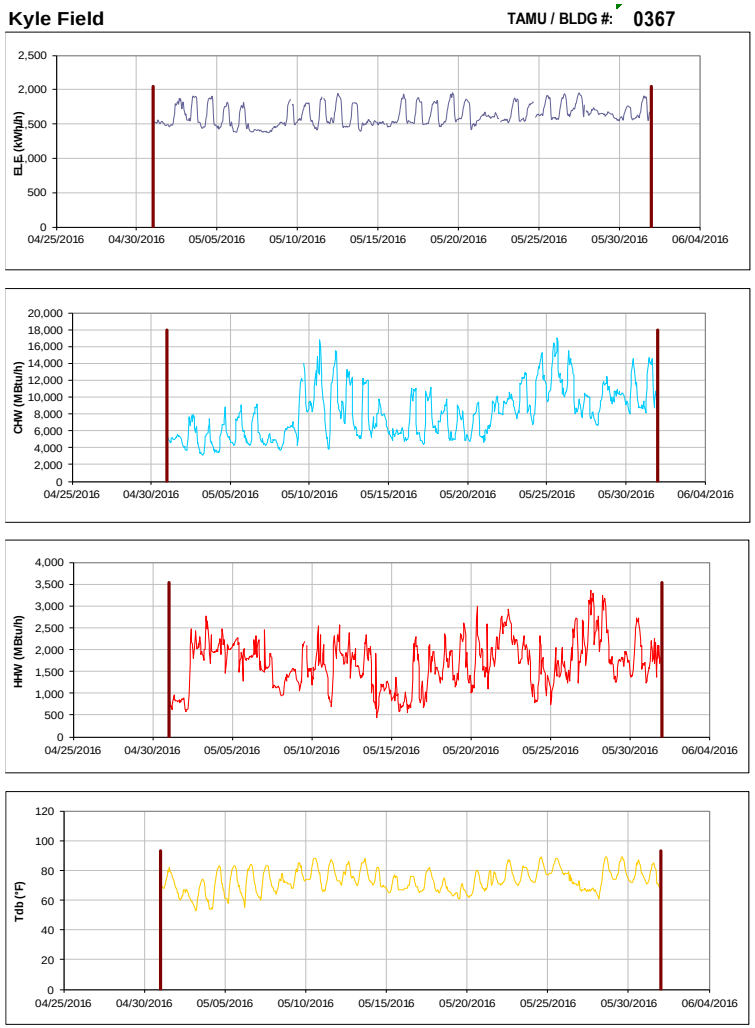


Figure III-16 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Kyle Field during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-17 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Chemistry Building Addition during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

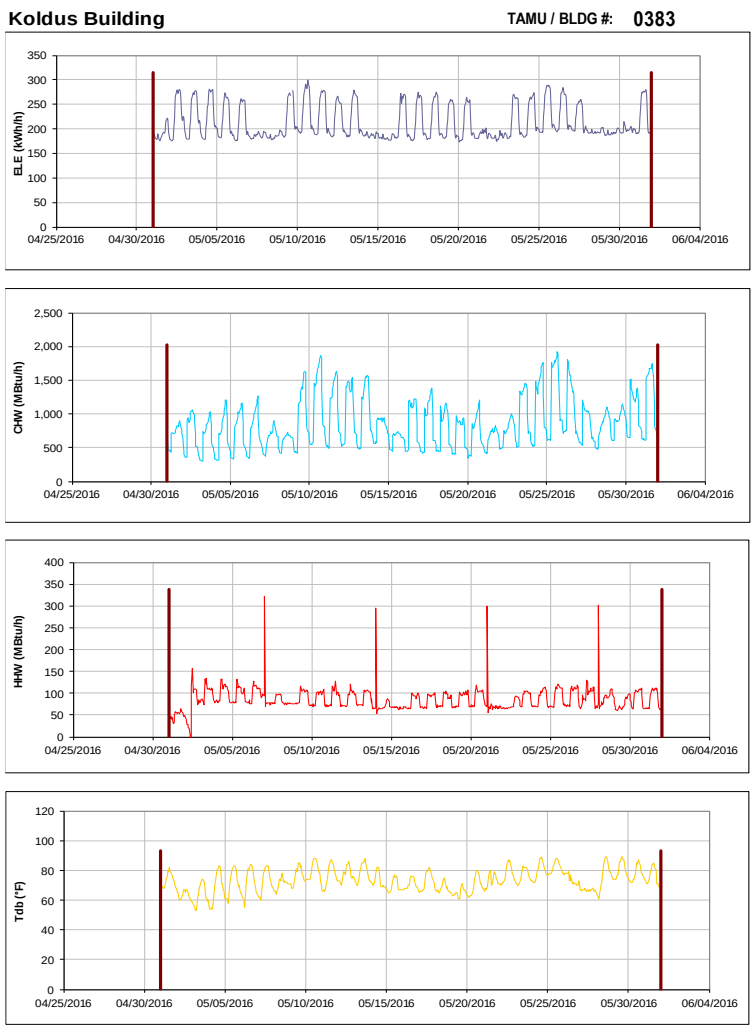


Figure III-18 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Koldus Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

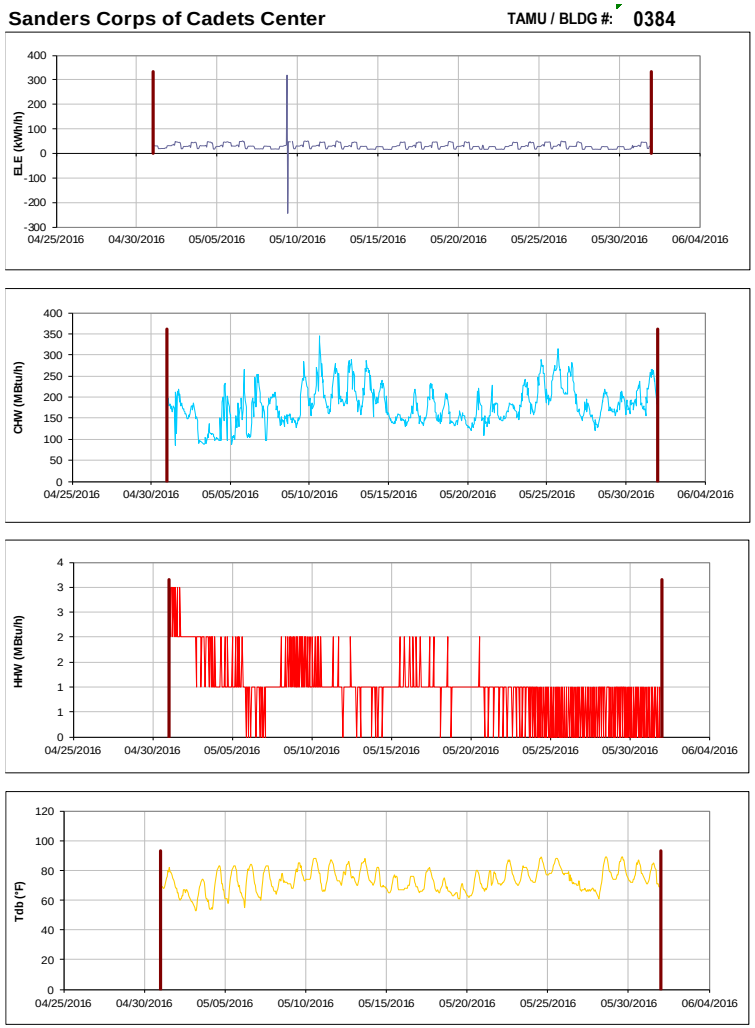


Figure III-19 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Sanders Corps of Cadets Center during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-20 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for CE TTI Office & Lab Building - Pi R Square during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-21 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Jack E. Brown Chemical Engineering Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

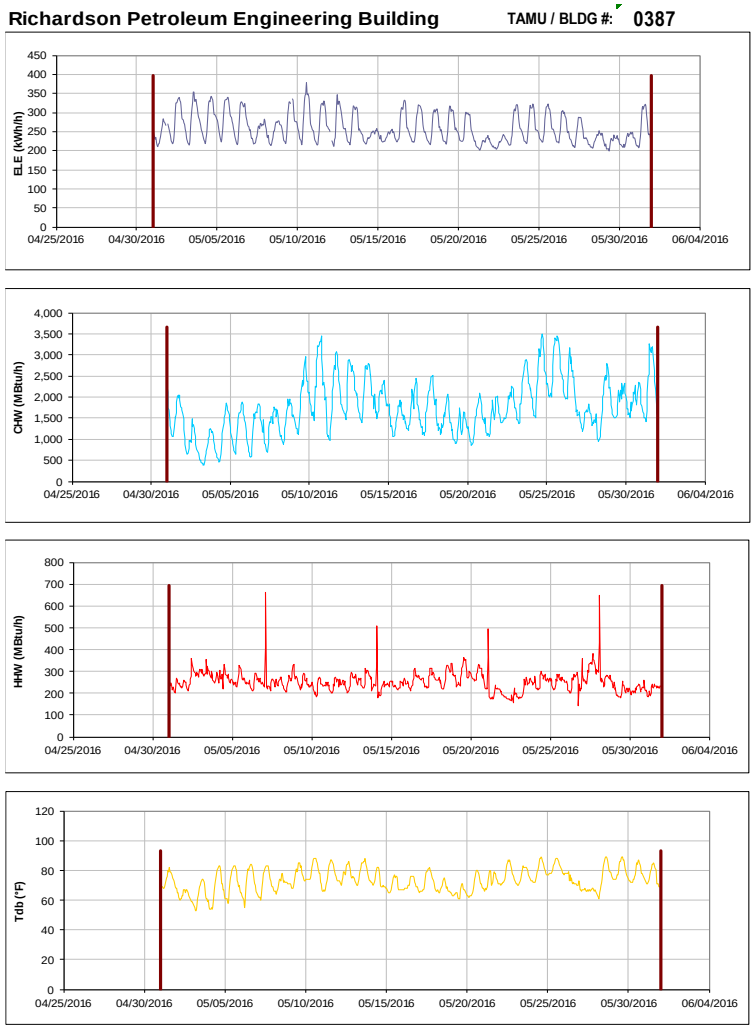


Figure III-22 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Richardson Petroleum Engineering Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

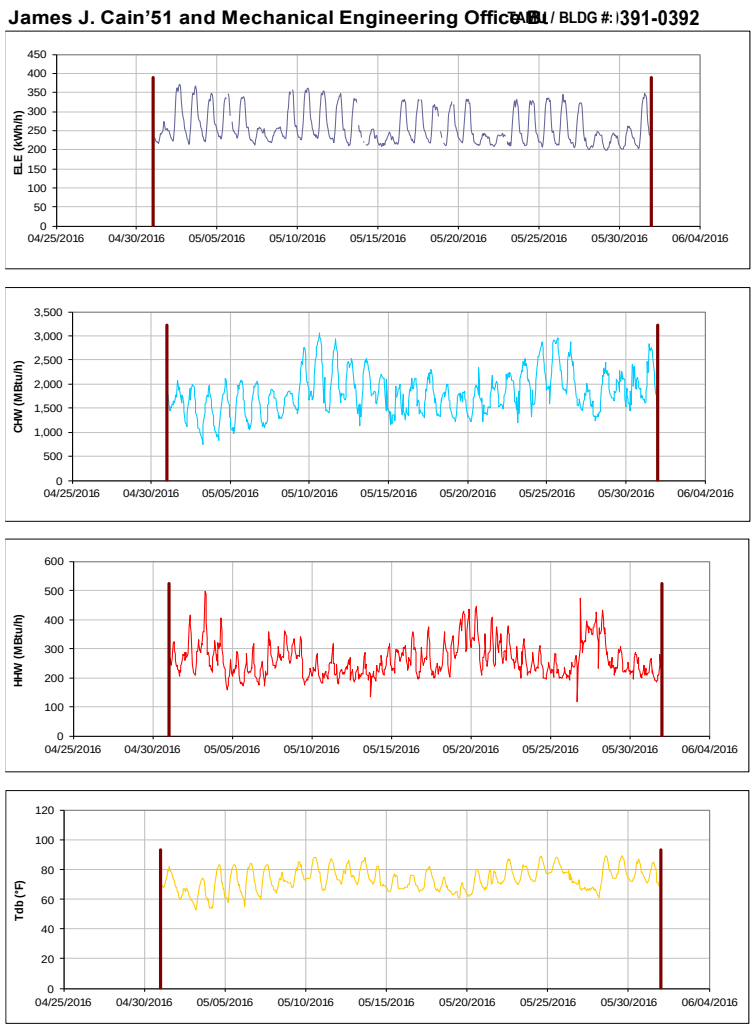


Figure III-23 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for James J. Cain'51 and Mechanical Engineering Office Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

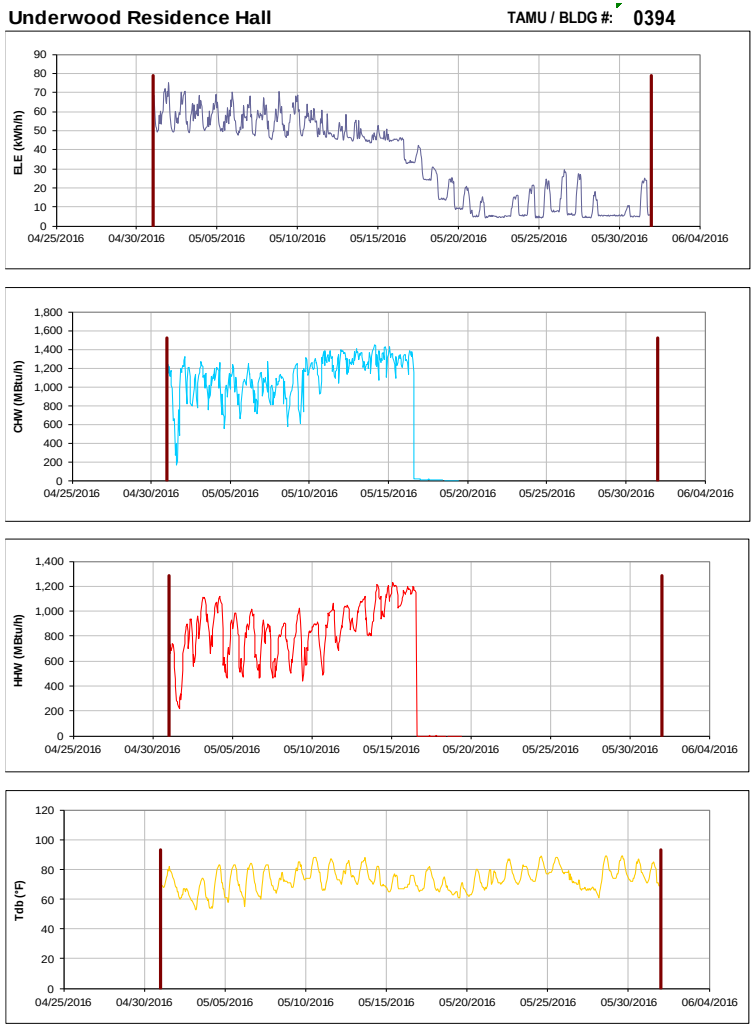


Figure III-24 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Underwood Residence Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

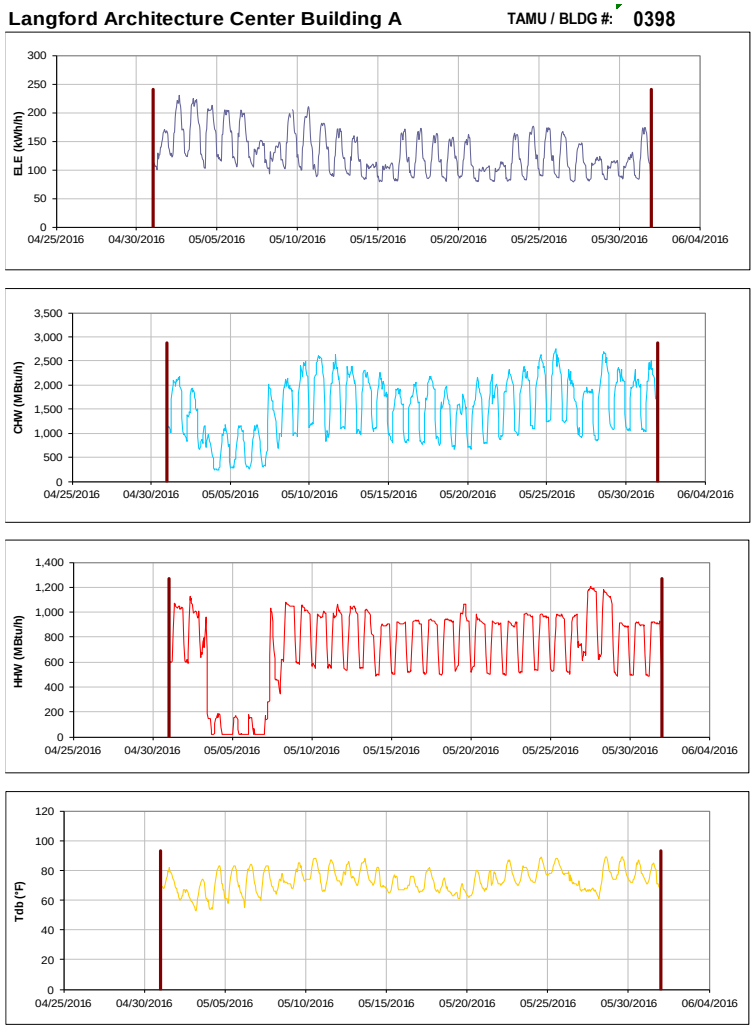


Figure III-25 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Langford Architecture Center Building A during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

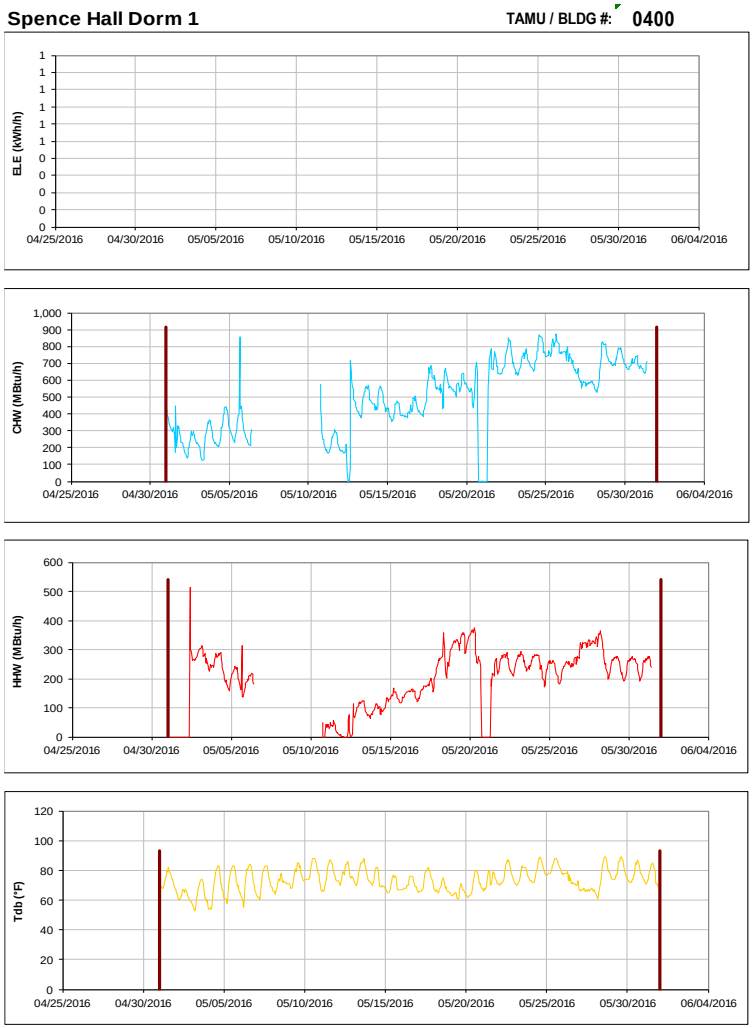


Figure III-26 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Spence Hall Dorm 1 during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

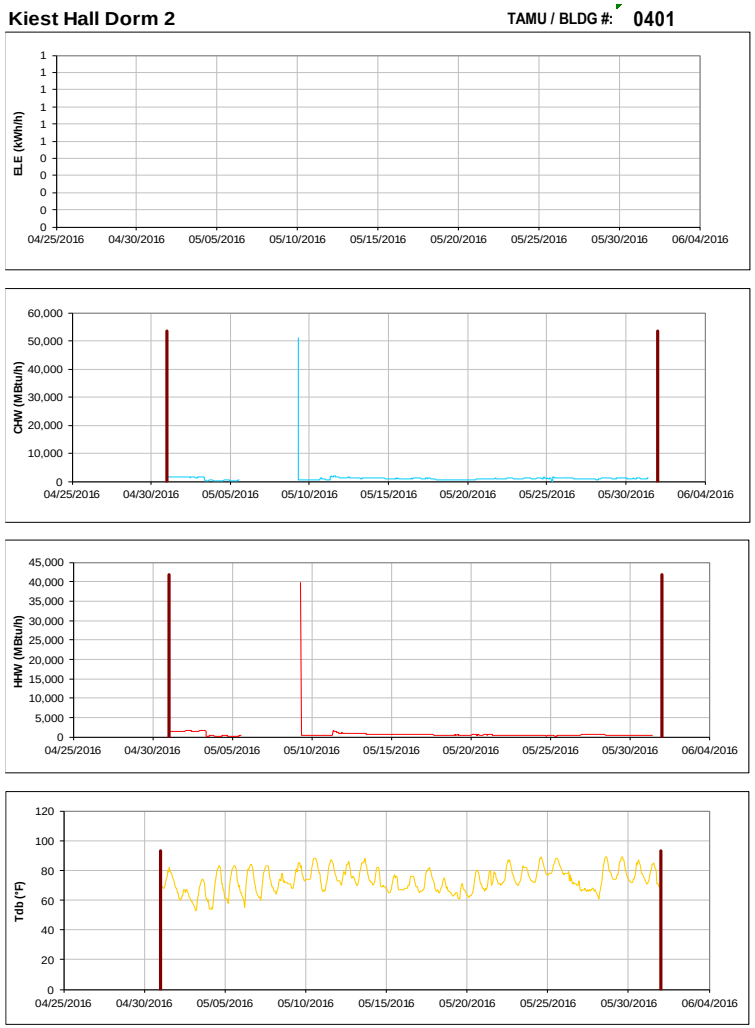


Figure III-27 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Kiest Hall Dorm 2 during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-28 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Briggs Hall Dorm 3 during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

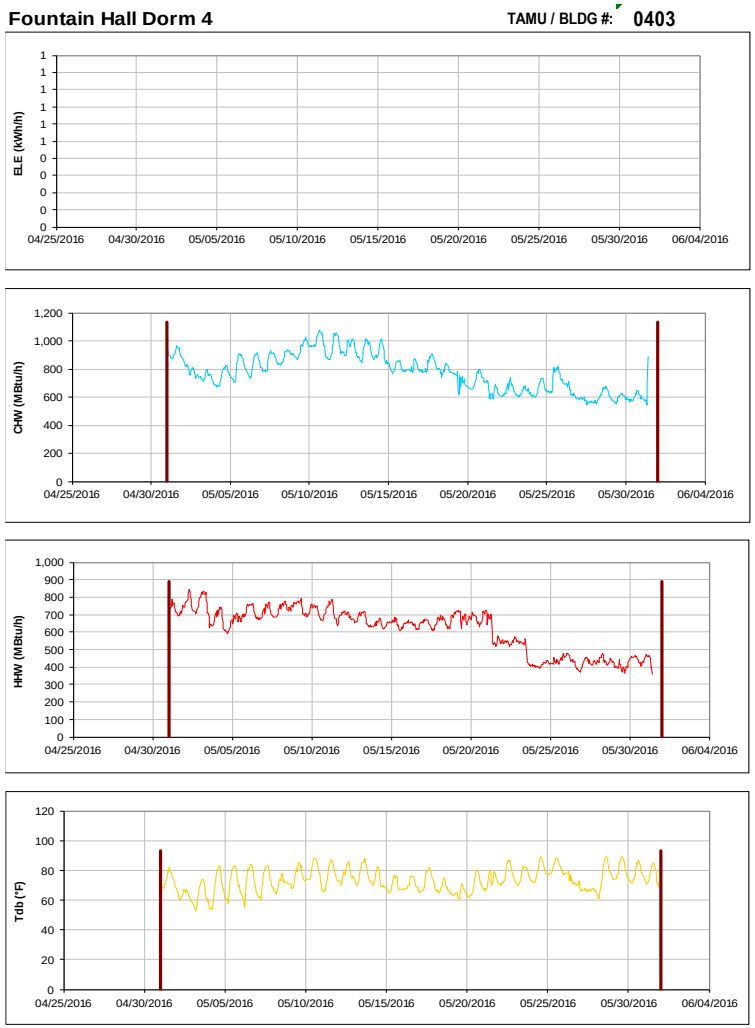


Figure III-29 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Fountain Hall Dorm 4 during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

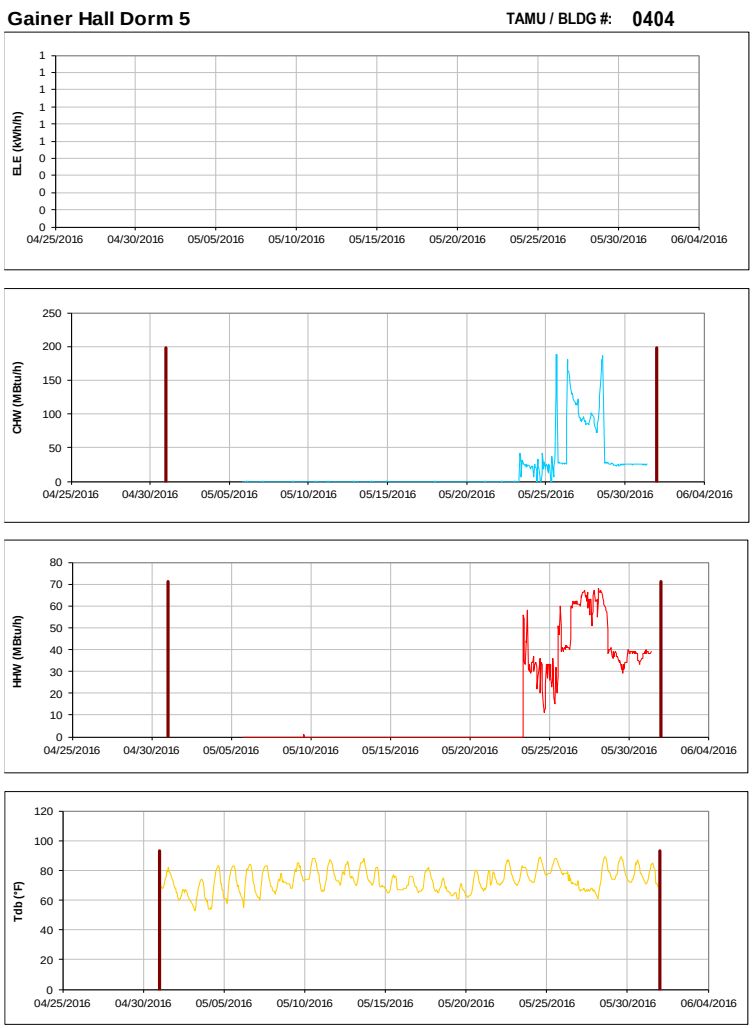


Figure III-30 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Gainer Hall Dorm 5 during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

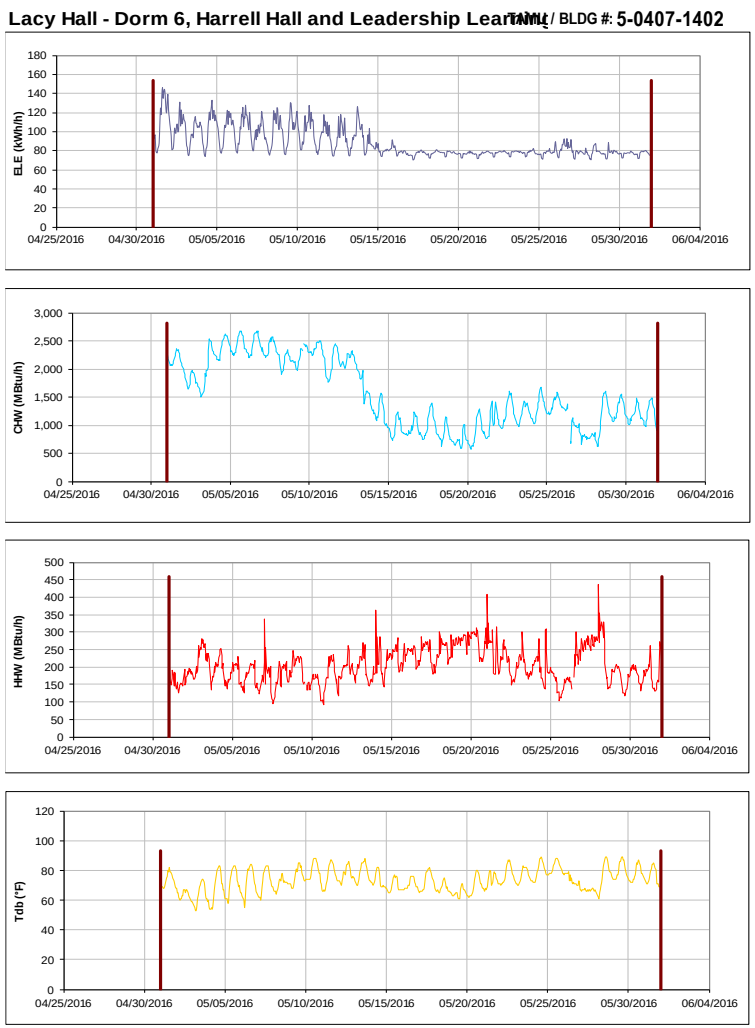


Figure III-31 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Lacy Hall - Dorm 6, Harrell Hall and Leadership Learning Center during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

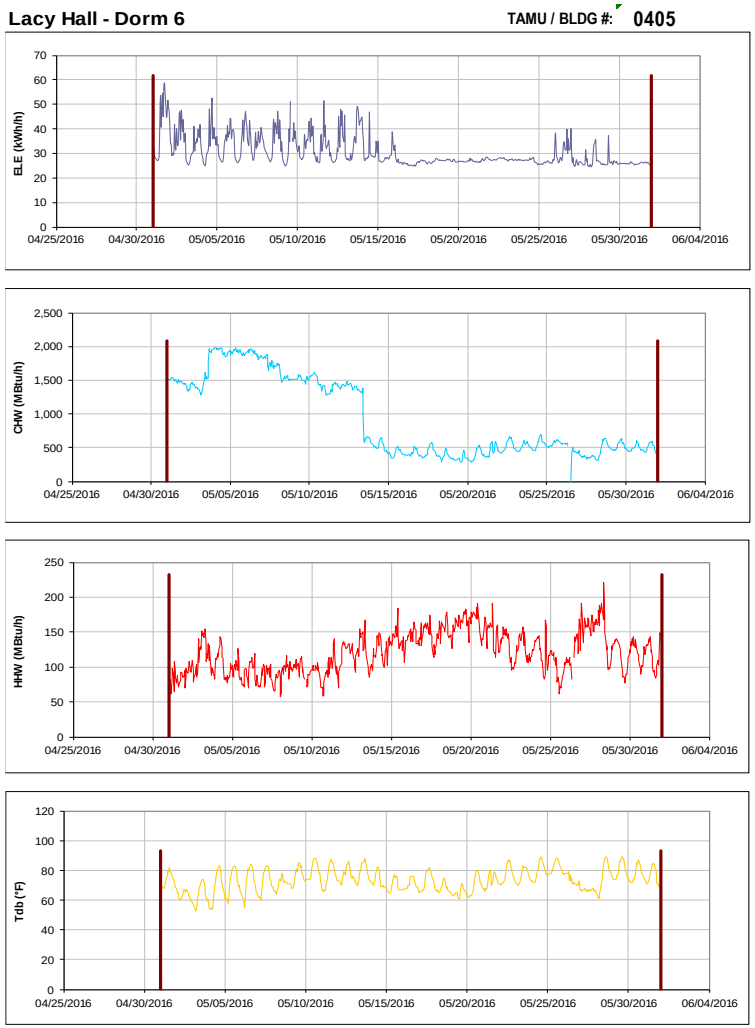


Figure III-32 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Lacy Hall - Dorm 6 during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

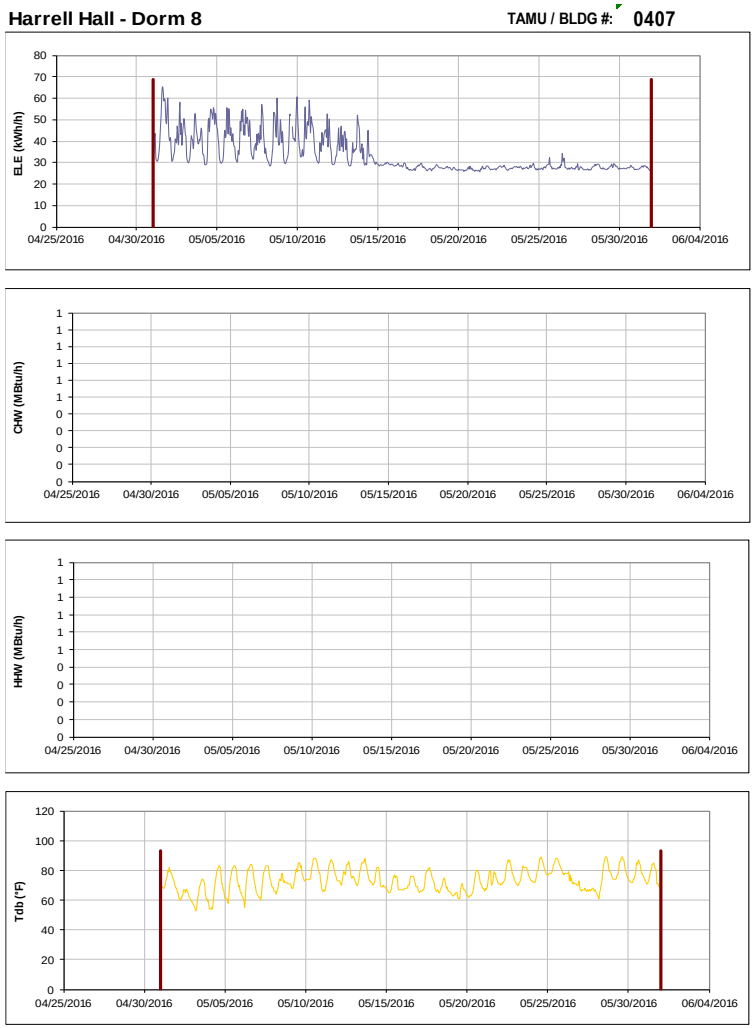


Figure III-33 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Harrell Hall - Dorm 8 during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

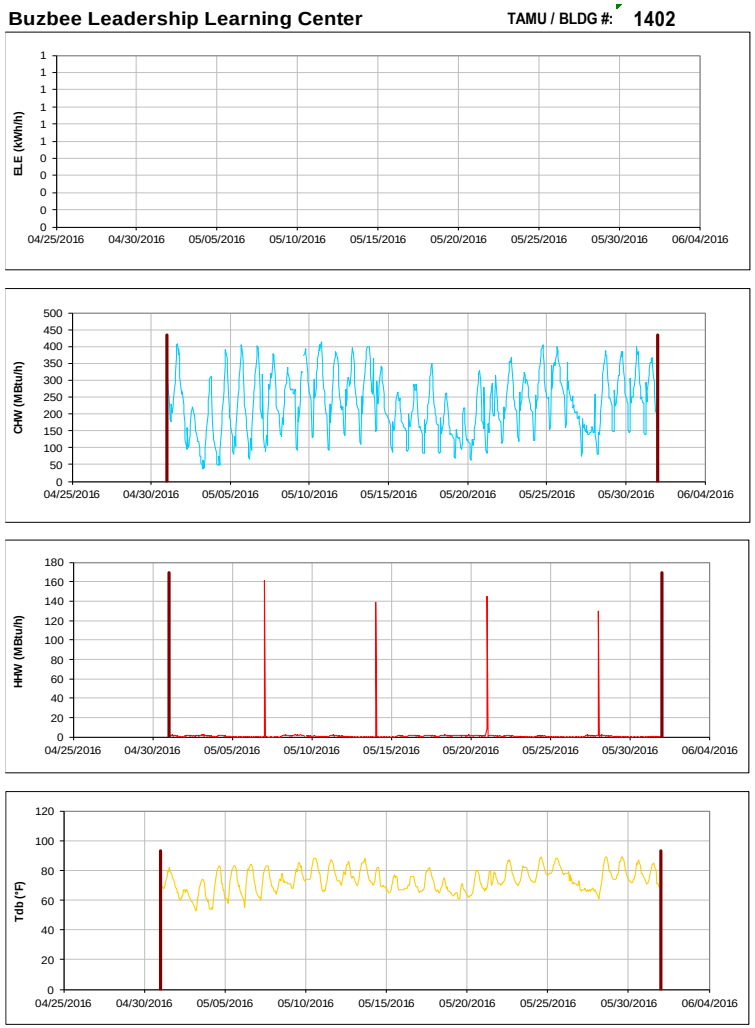


Figure III-34 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Buzbee Leadership Learning Center during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

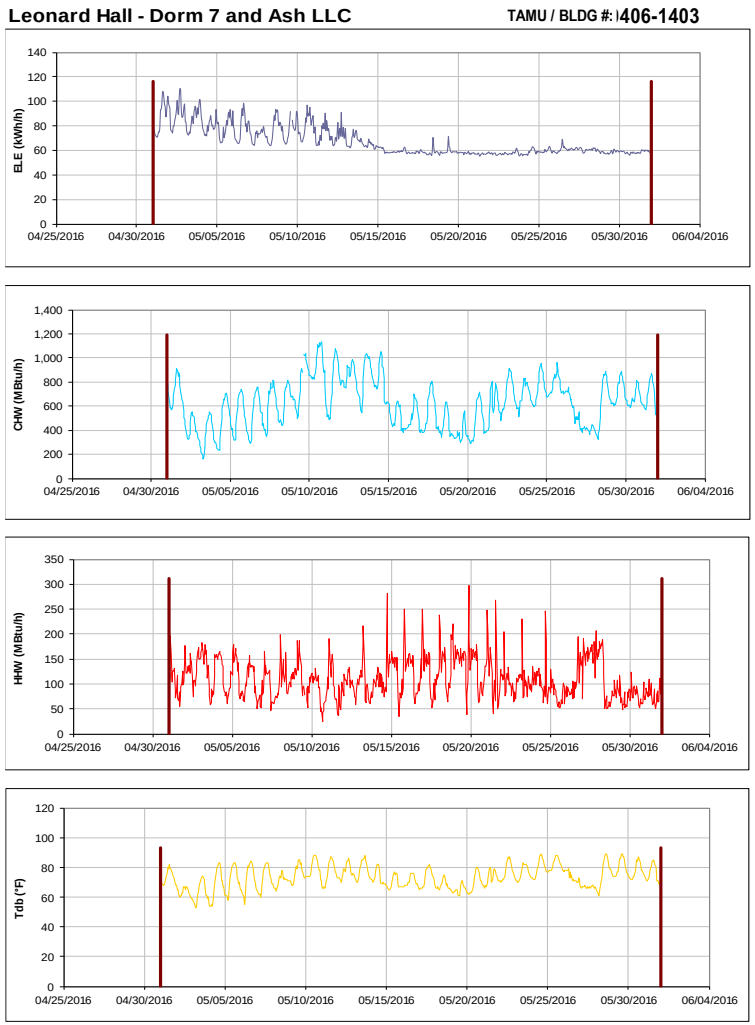


Figure III-35 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Leonard Hall - Dorm 7 and Ash LLC during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

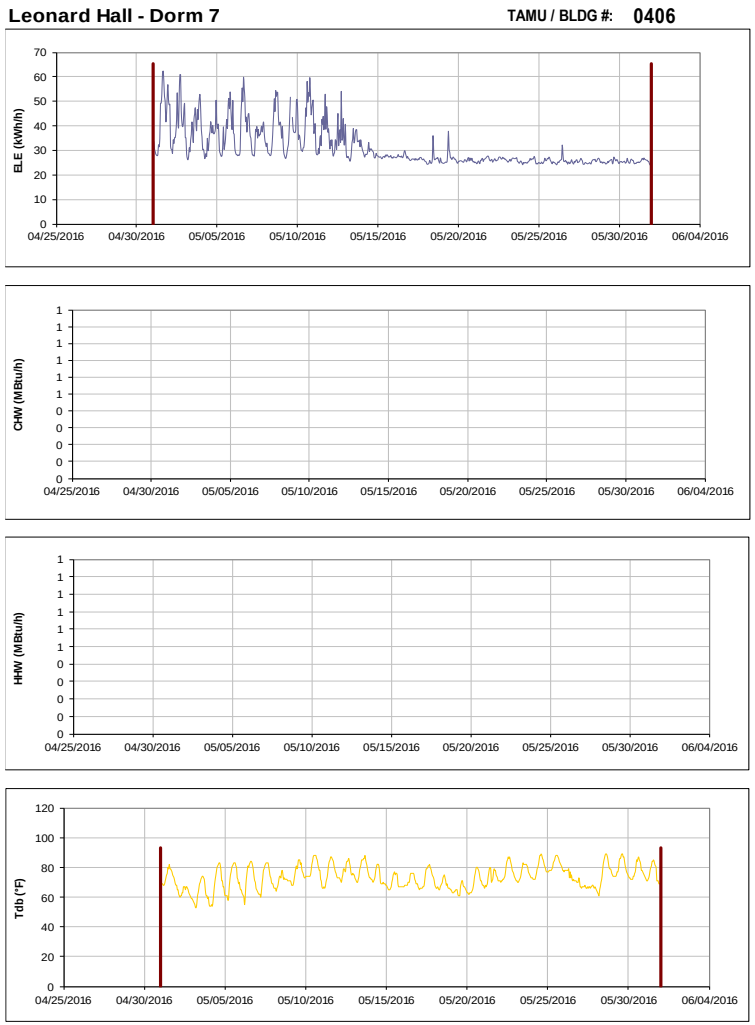


Figure III-36 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Leonard Hall - Dorm 7 during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

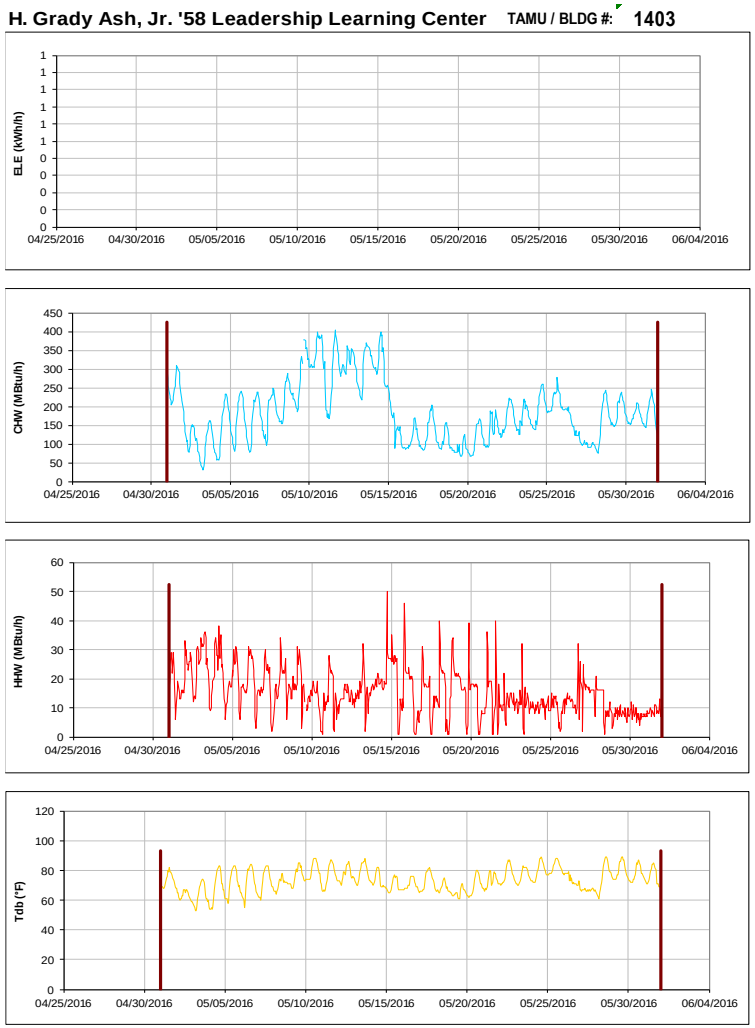


Figure III-37 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for H. Grady Ash, Jr. '58 Leadership Learning Center during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

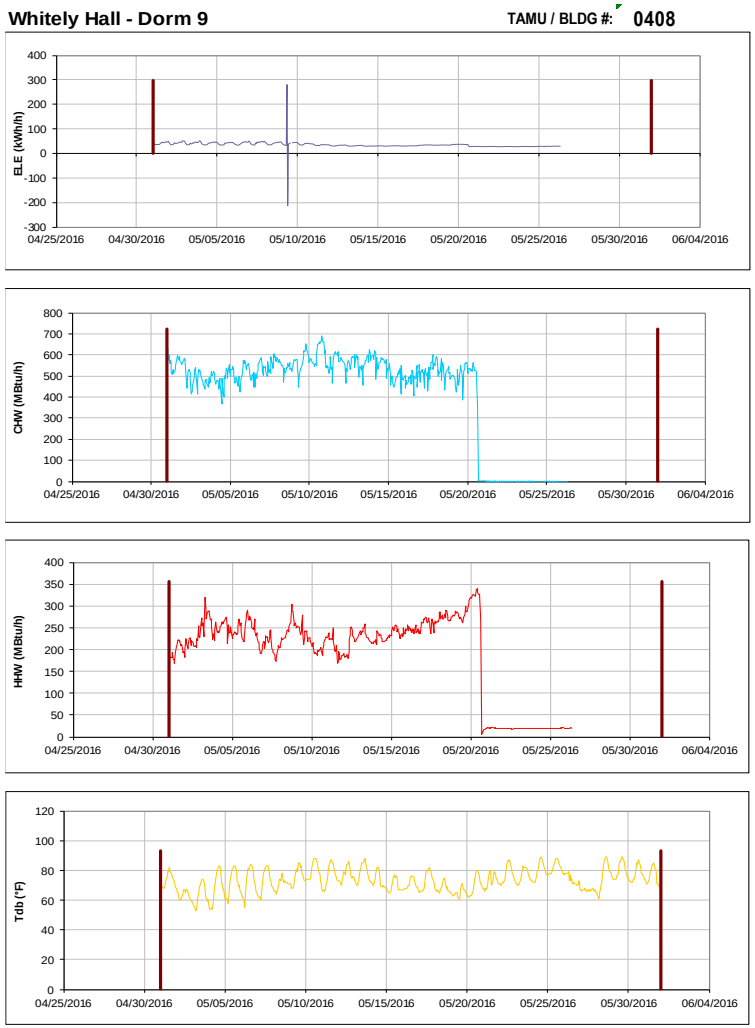


Figure III-38 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Whitely Hall - Dorm 9 during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

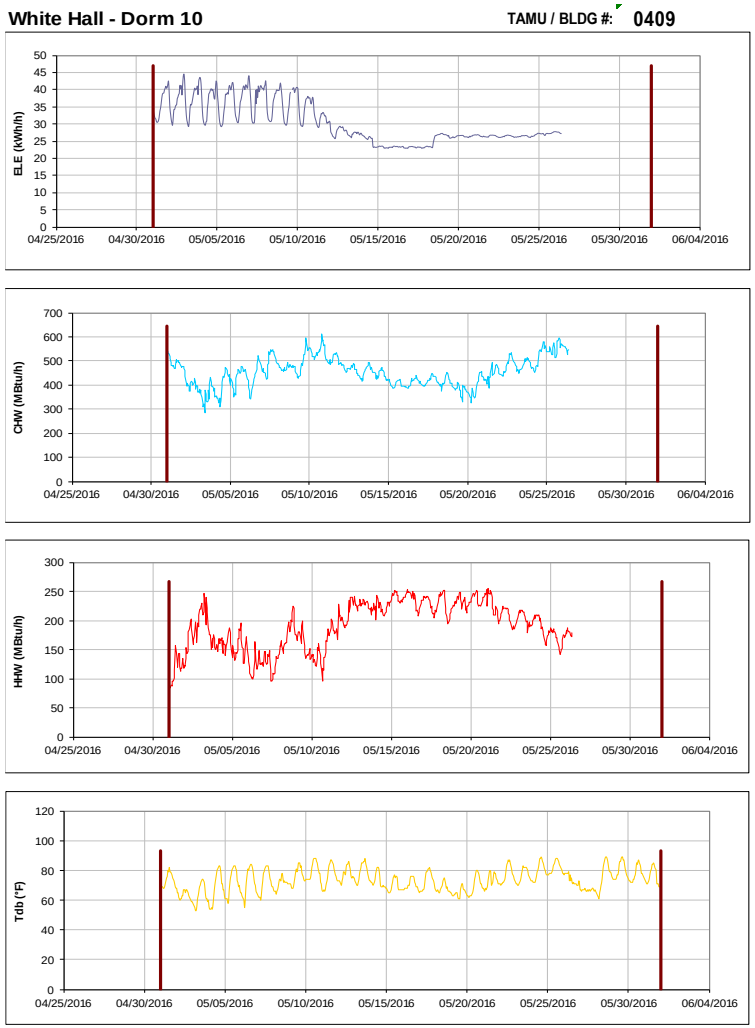


Figure III-39 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for White Hall - Dorm 10 during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

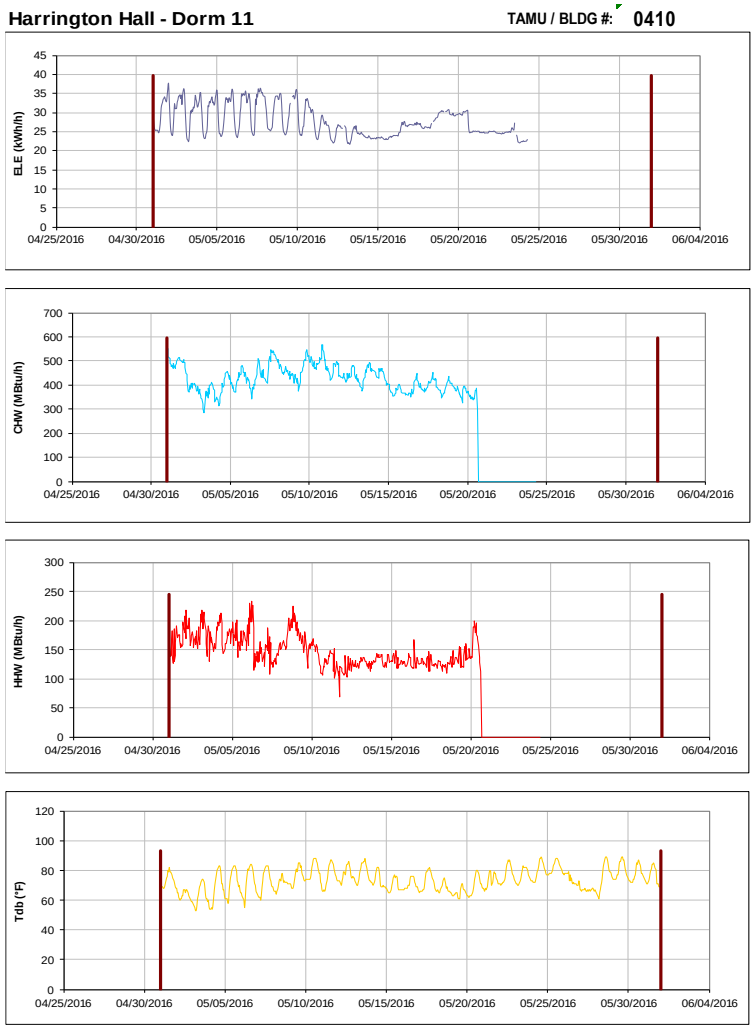


Figure III-40 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Harrington Hall - Dorm 11 during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-41 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Utay Hall - Dorm 12 during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

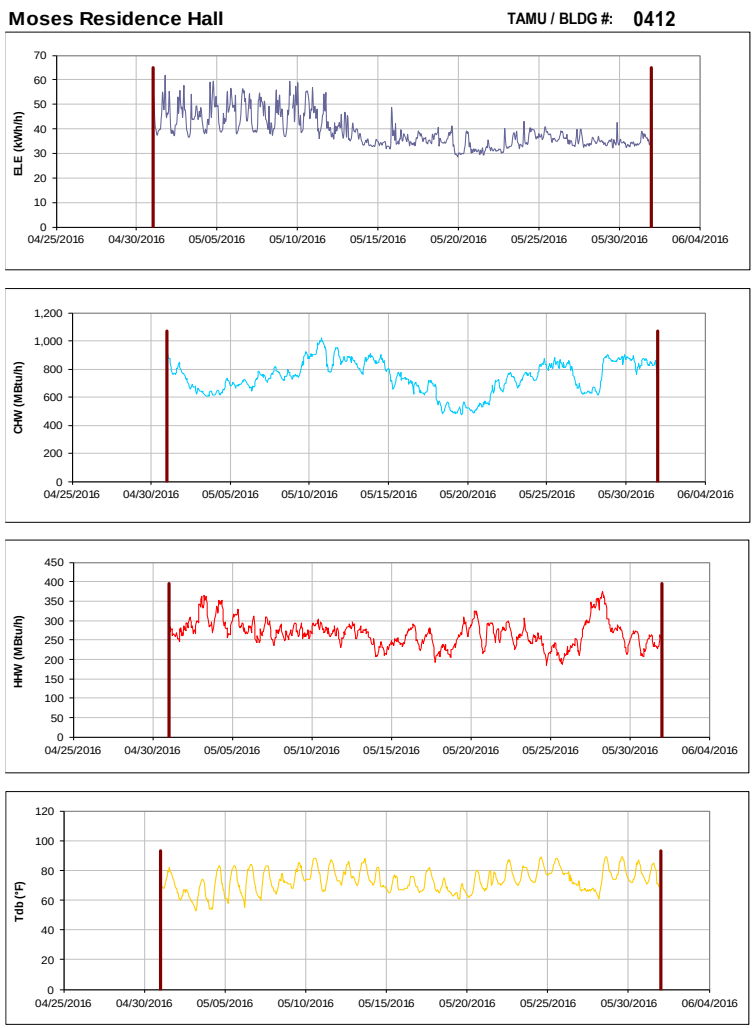


Figure III-42 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Moses Residence Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

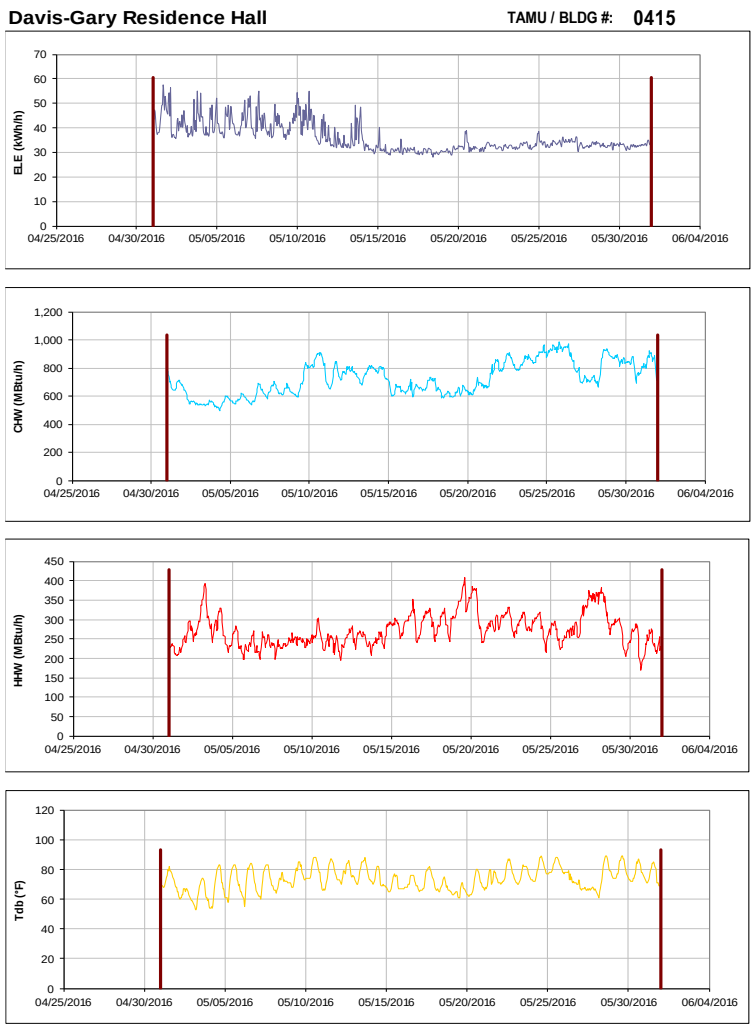


Figure III-43 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Davis-Gary Residence Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

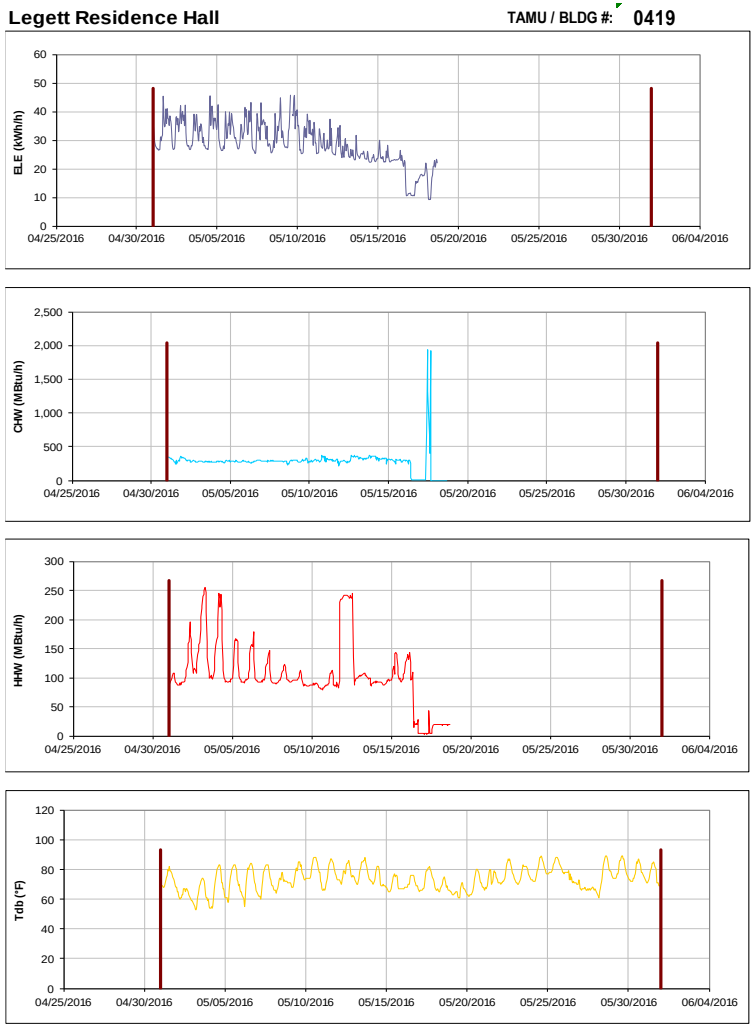


Figure III-44 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Legett Residence Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

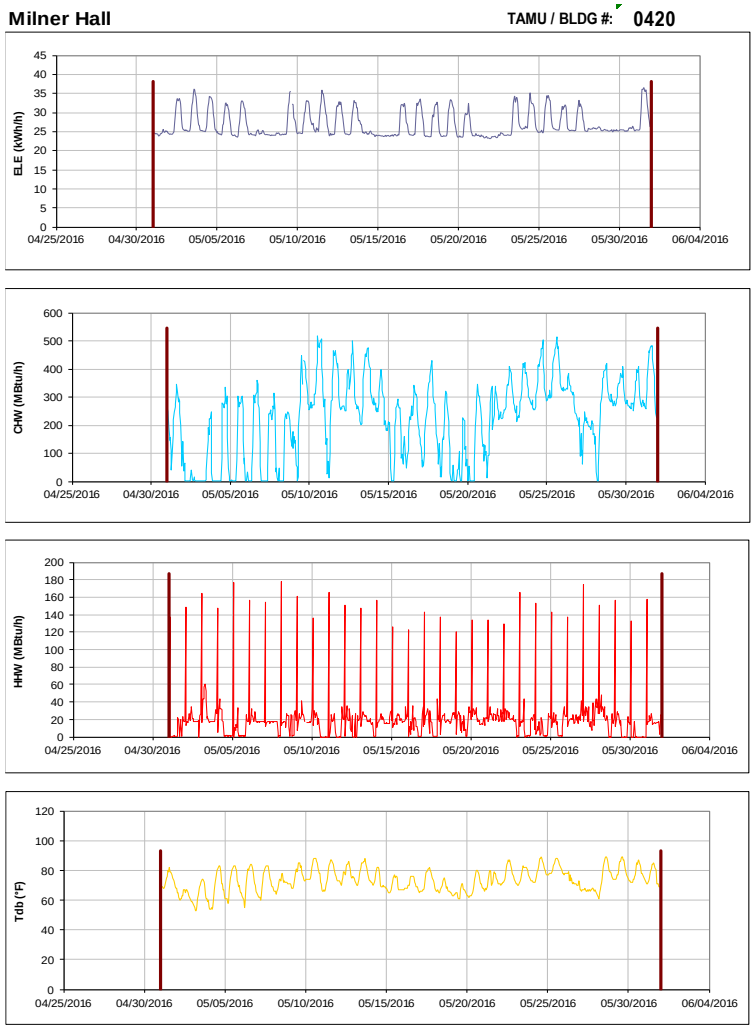


Figure III-45 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Milner Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

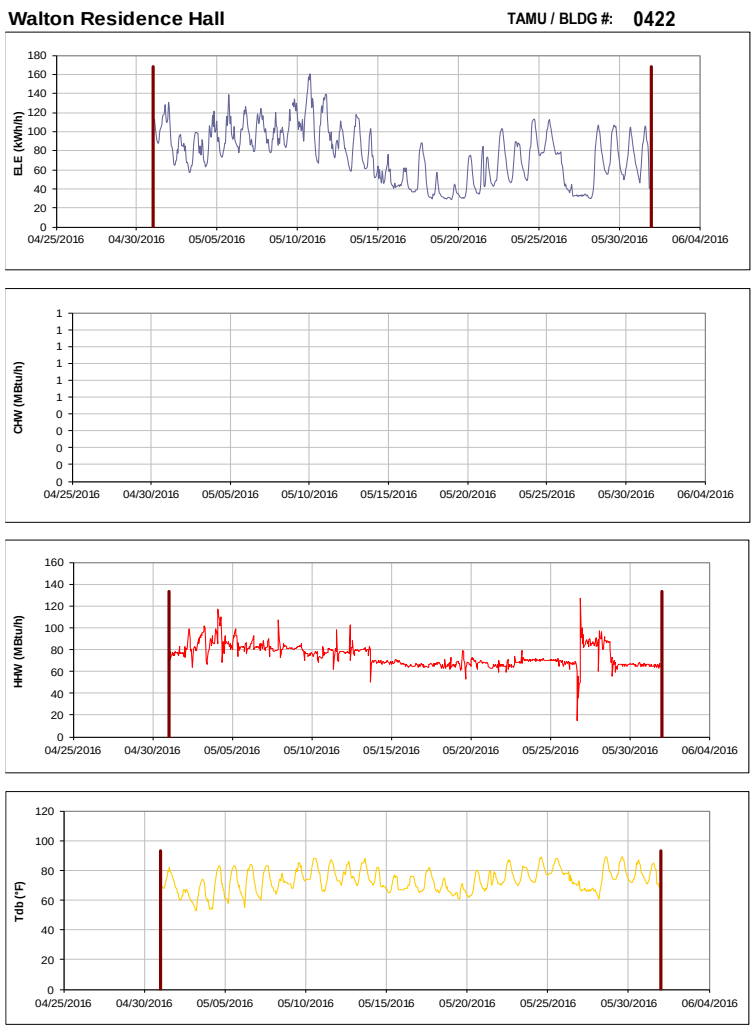


Figure III-46 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Walton Residence Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

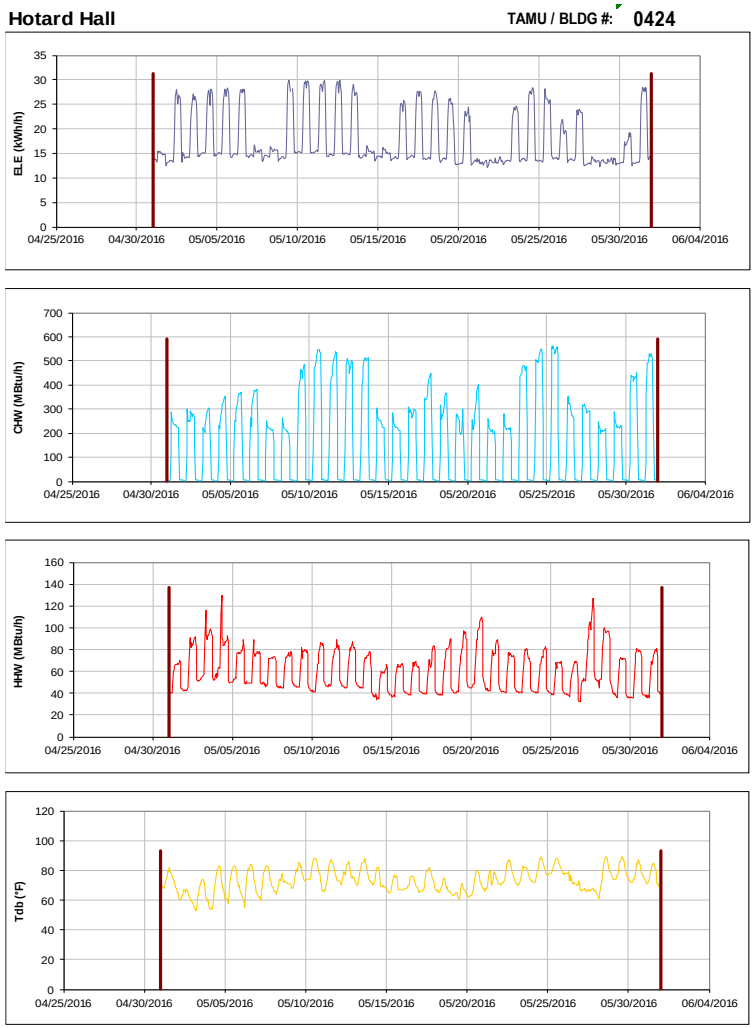


Figure III-47 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Hotard Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

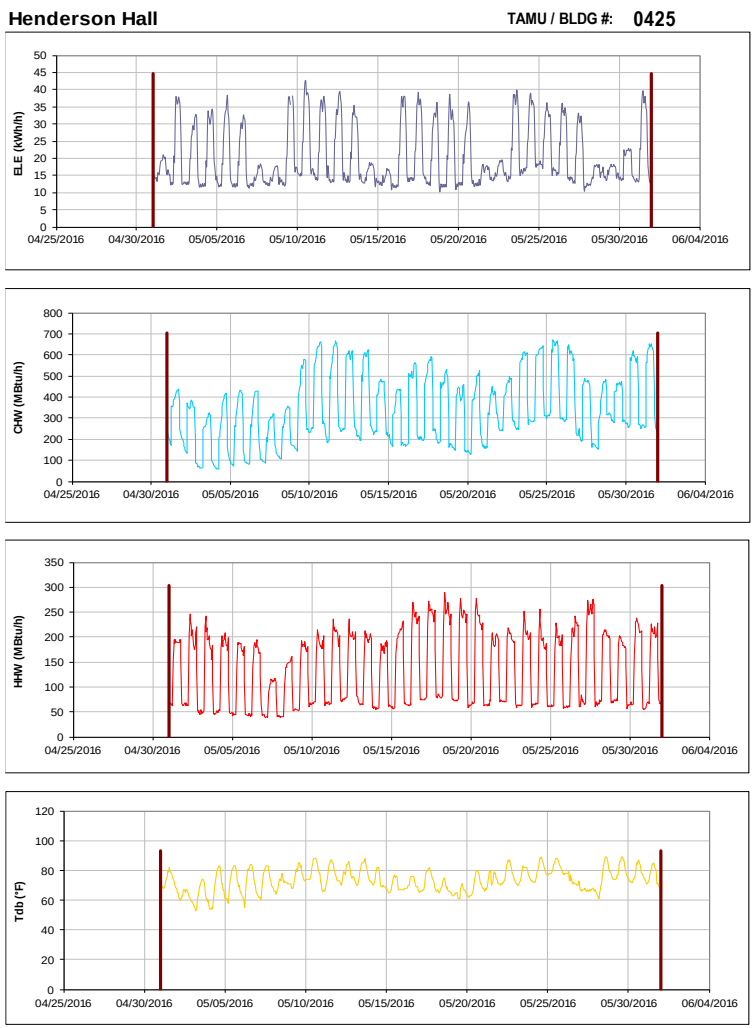


Figure III-48 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Henderson Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

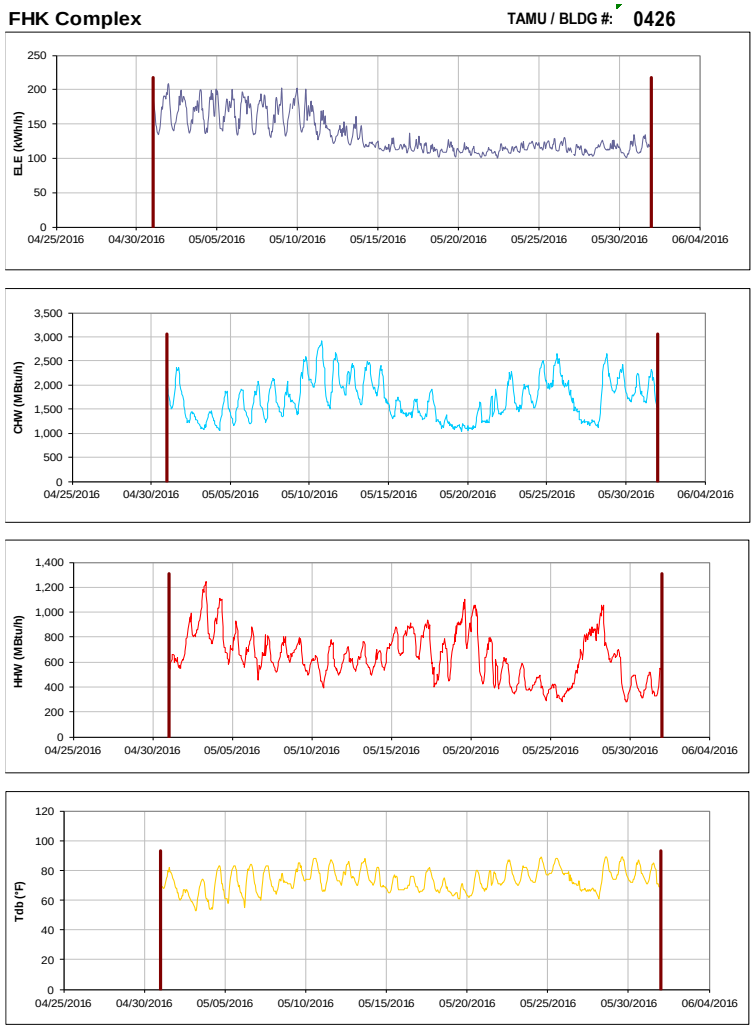


Figure III-49 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for FHK Complex during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

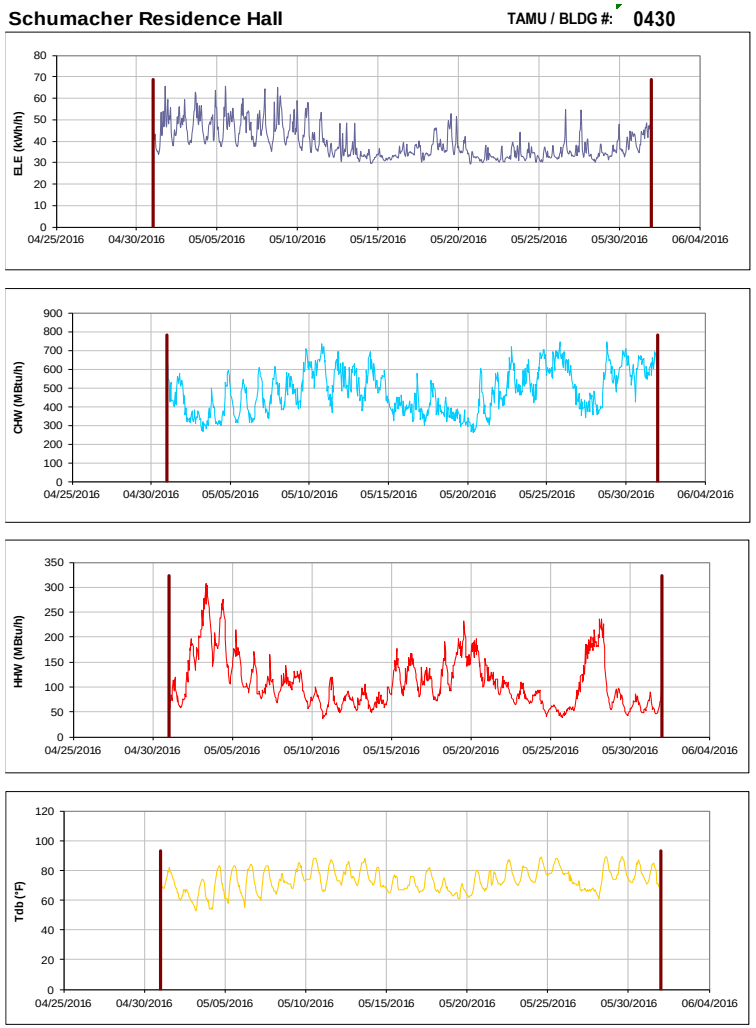


Figure III-50 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Schumacher Residence Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

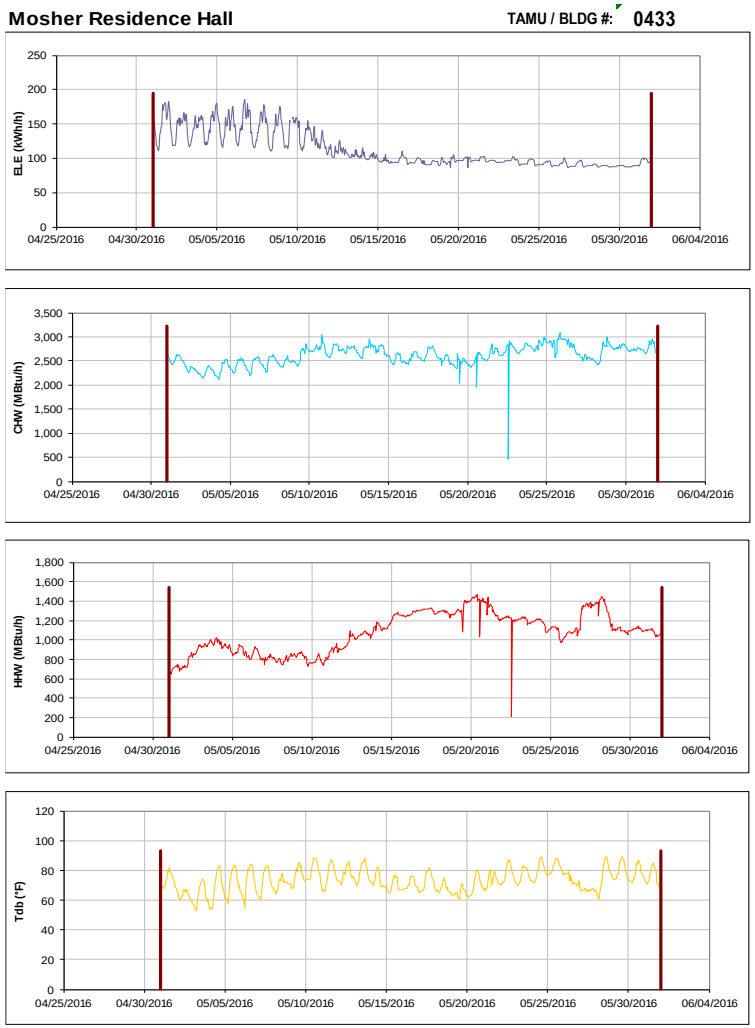


Figure III-51 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Mosher Residence Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

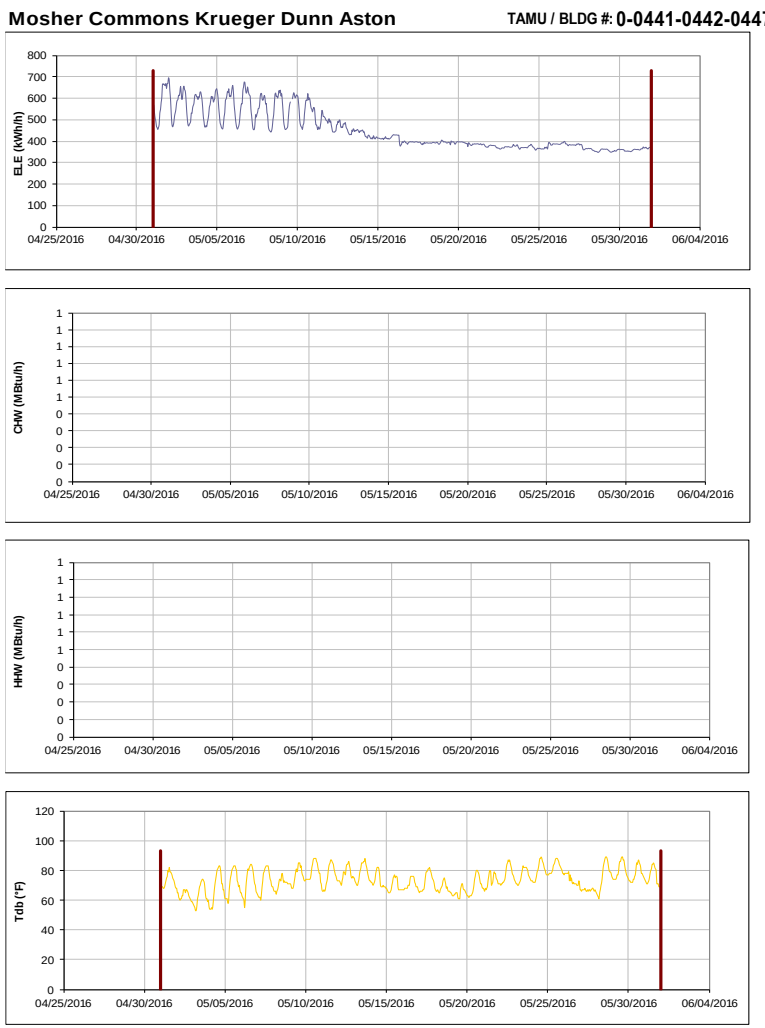


Figure III-52 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Mosher Commons Krueger Dunn Aston during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

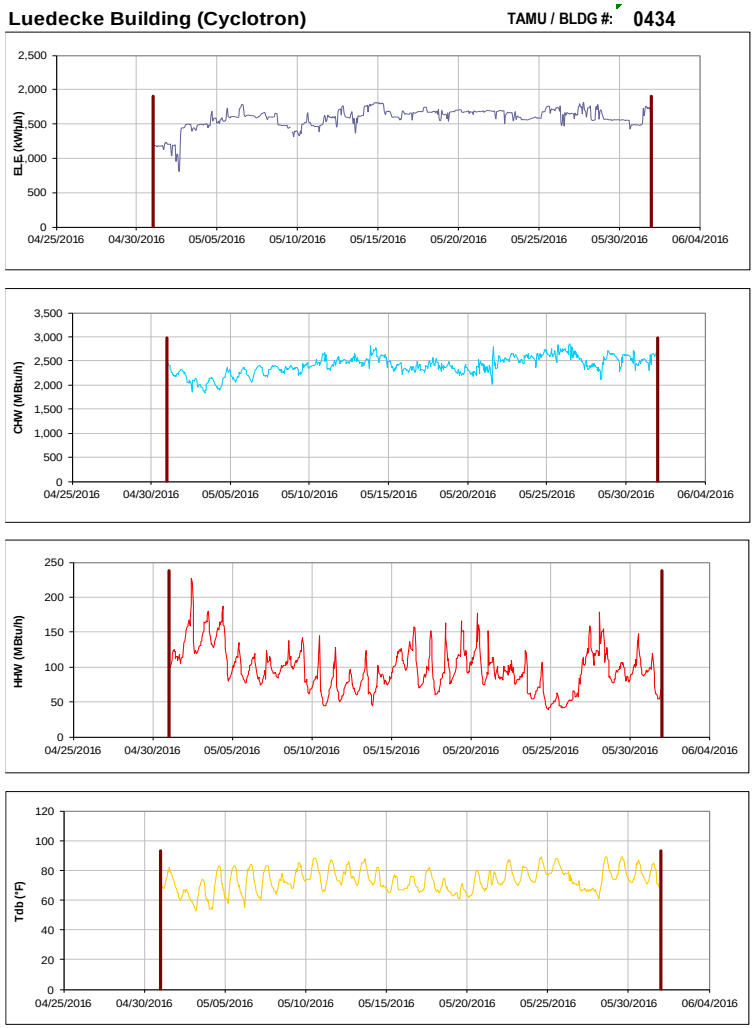


Figure III-53 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Luedecke Building (Cyclotron) during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

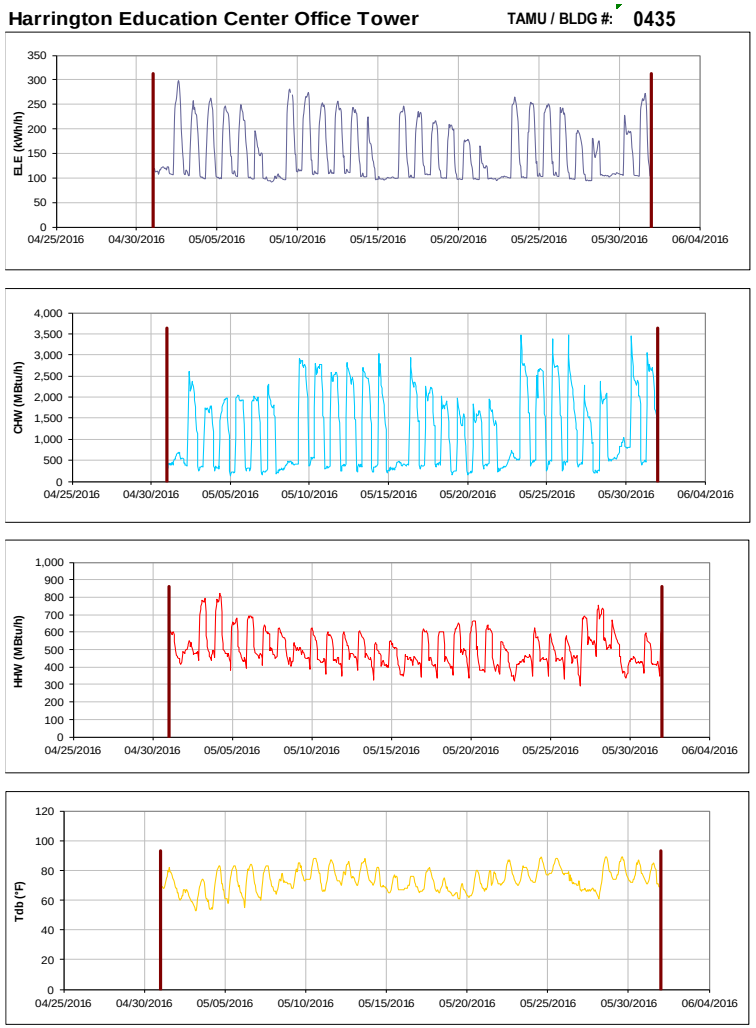


Figure III-54 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Harrington Education Center Office Tower during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

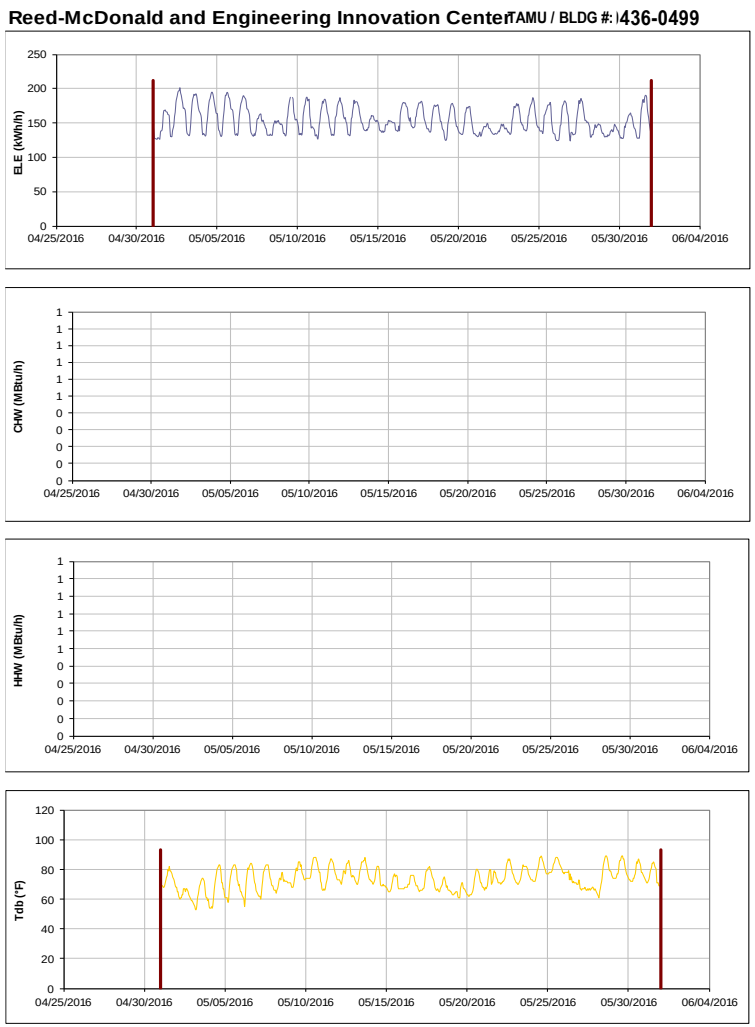


Figure III-55 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Reed-McDonald and Engineering Innovation Center during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-56 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Reed-McDonald Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

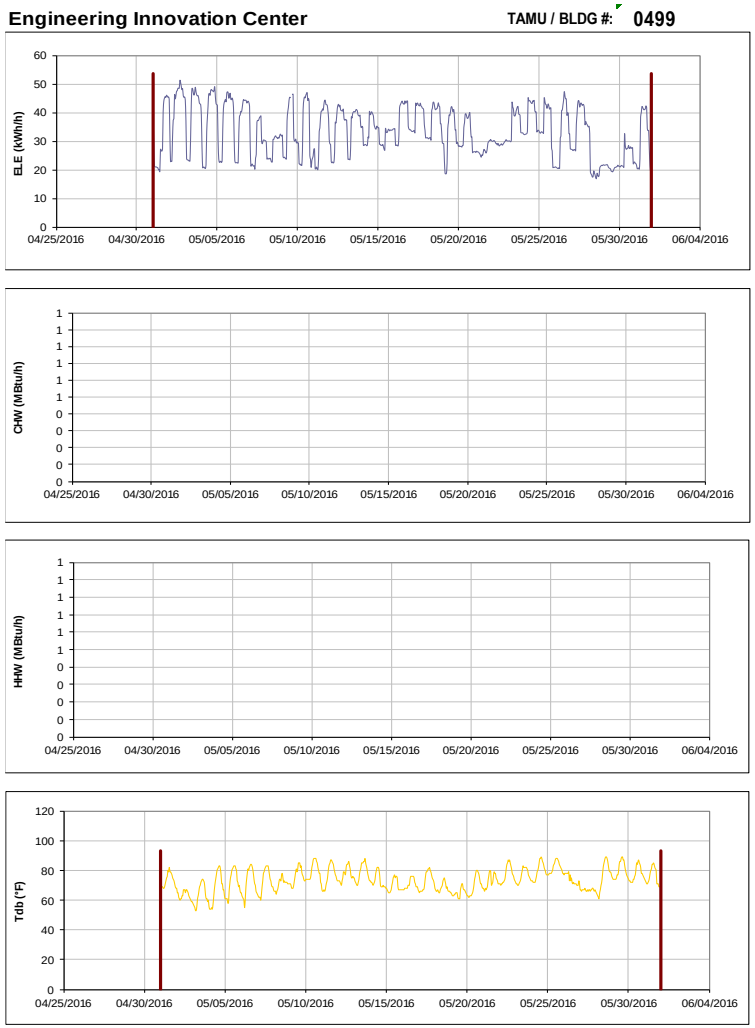


Figure III-57 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Engineering Innovation Center during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

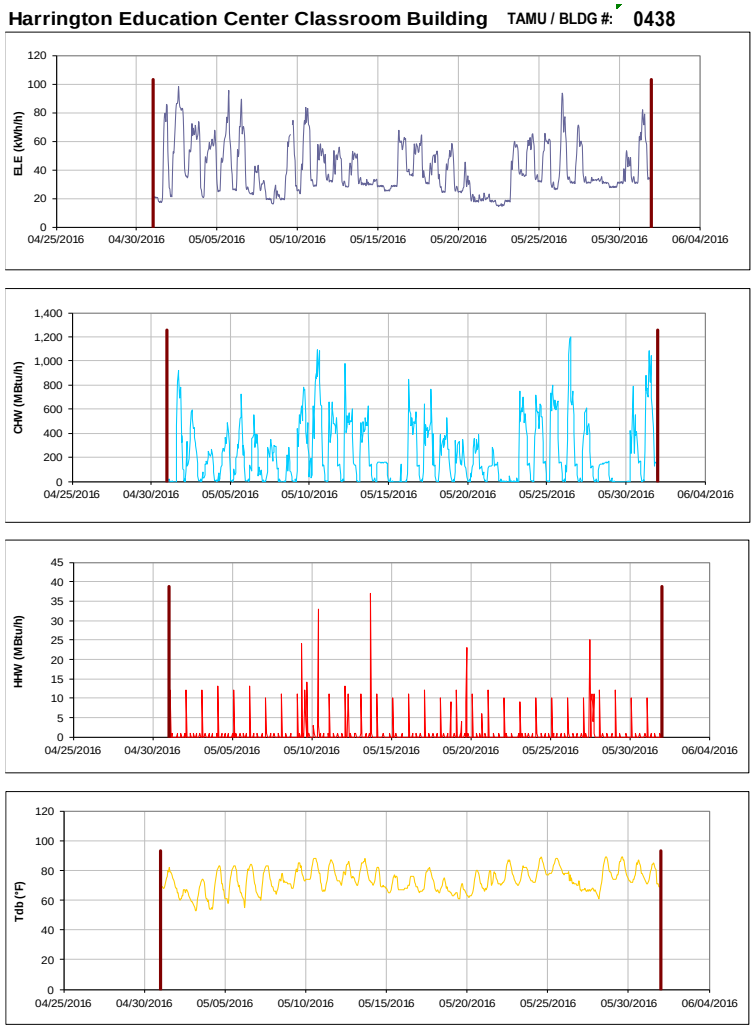


Figure III-58 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Harrington Education Center Classroom Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

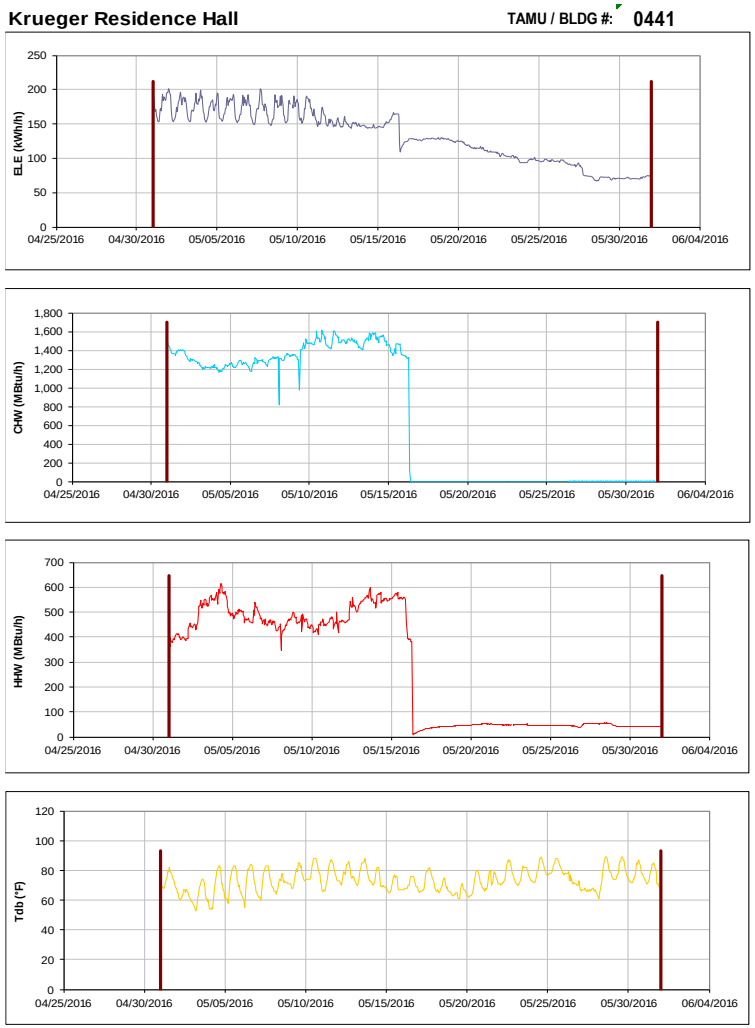


Figure III-59 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Krueger Residence Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-60 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Dunn Residence Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-61 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Oceanography & Meteorology Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

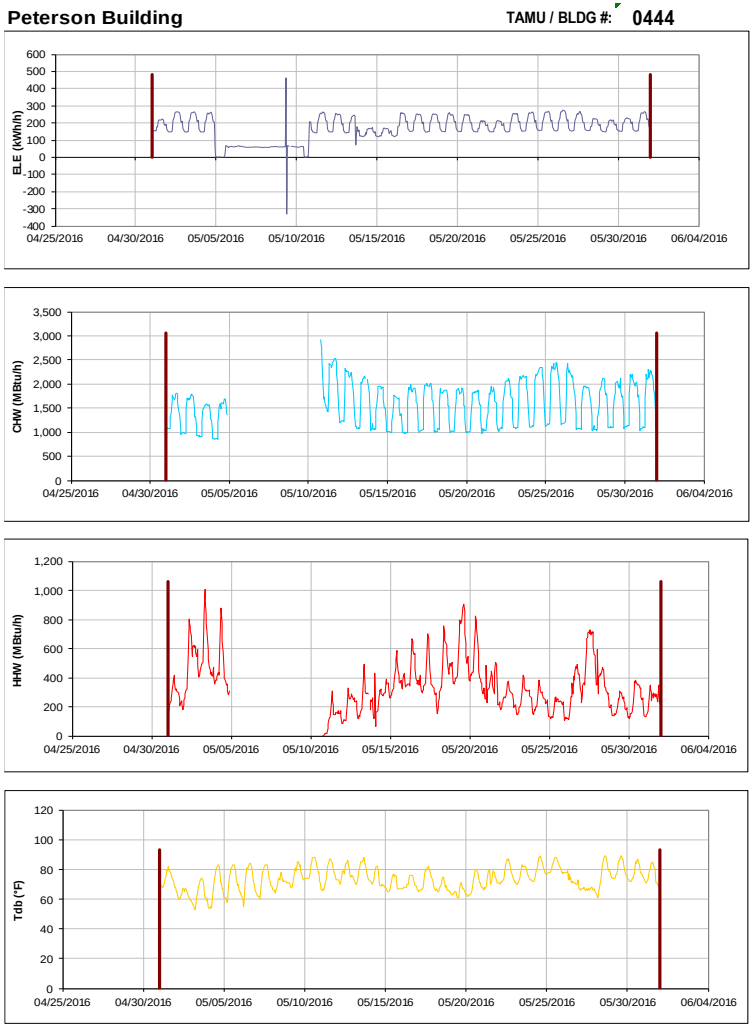


Figure III-62 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Peterson Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

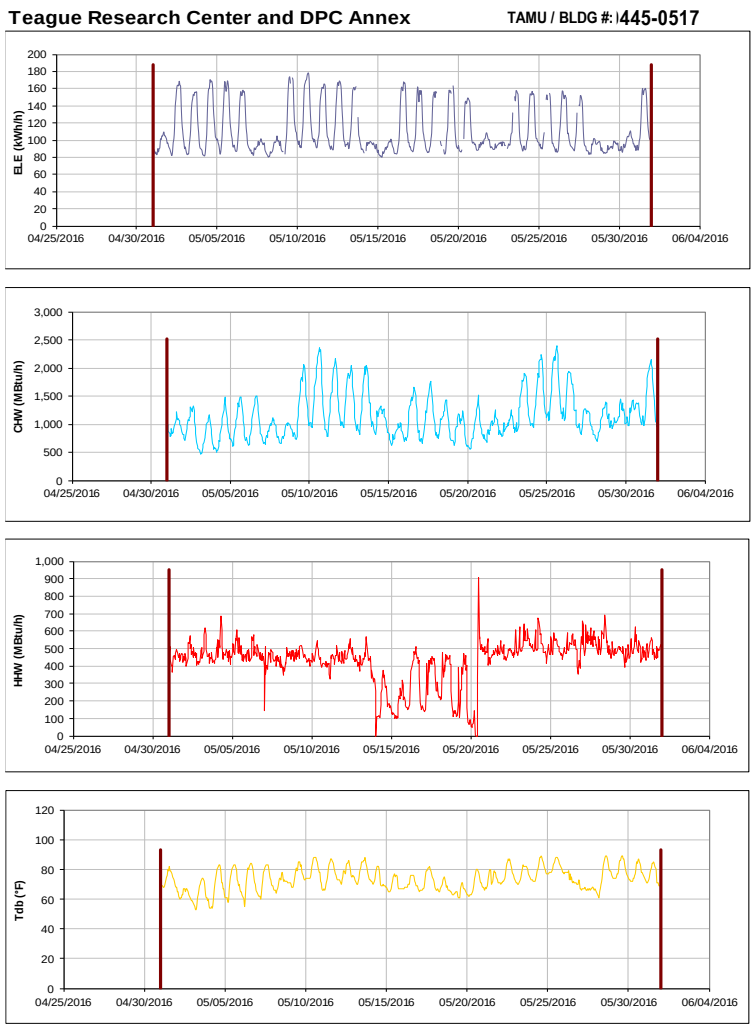


Figure III-63 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Teague Research Center and DPC Annex during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

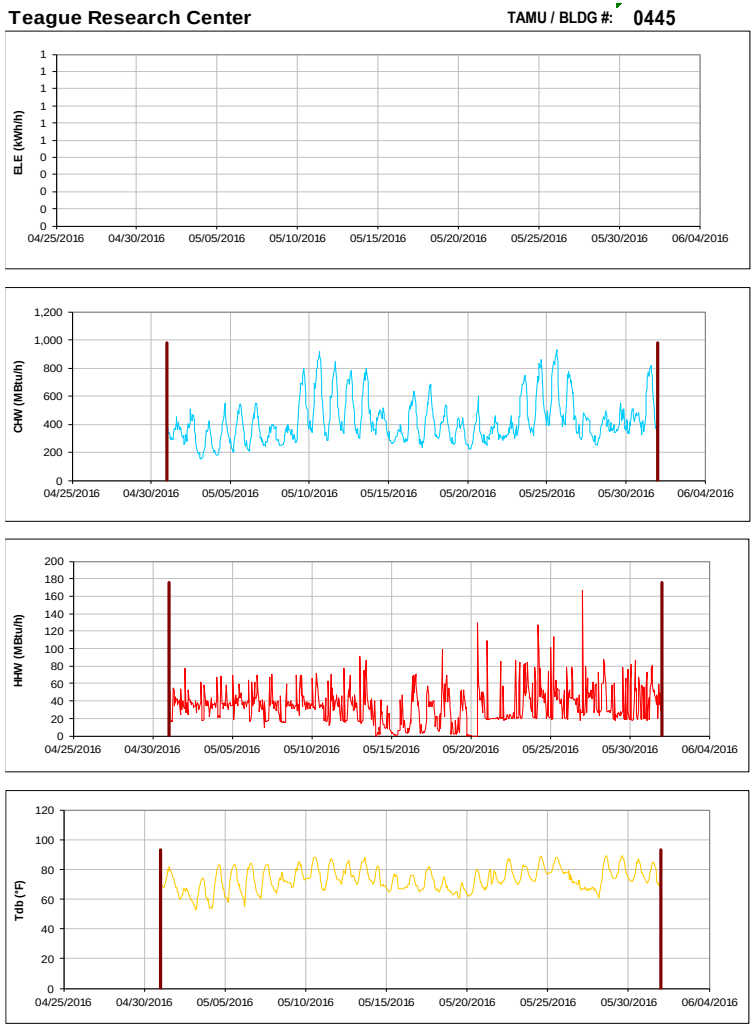


Figure III-64 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Teague Research Center during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-65 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for DPC Annex during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

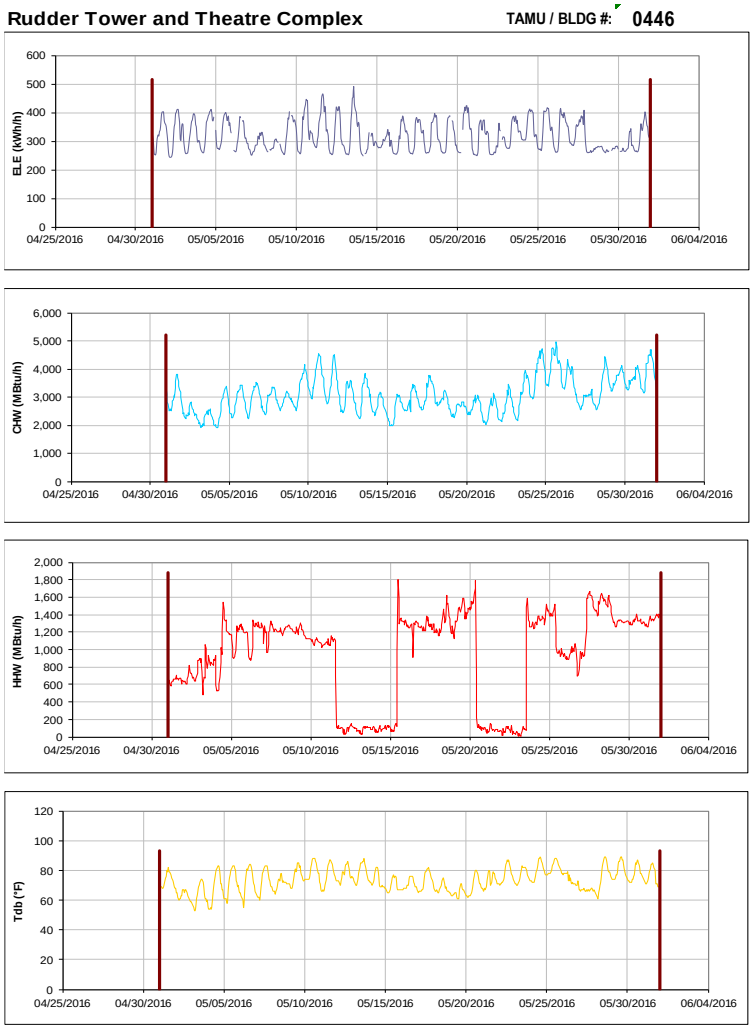


Figure III-66 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Rudder Tower and Theatre Complex during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-67 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Rudder Theatre Complex during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-68 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Rudder Tower during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-69 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Aston Residence Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

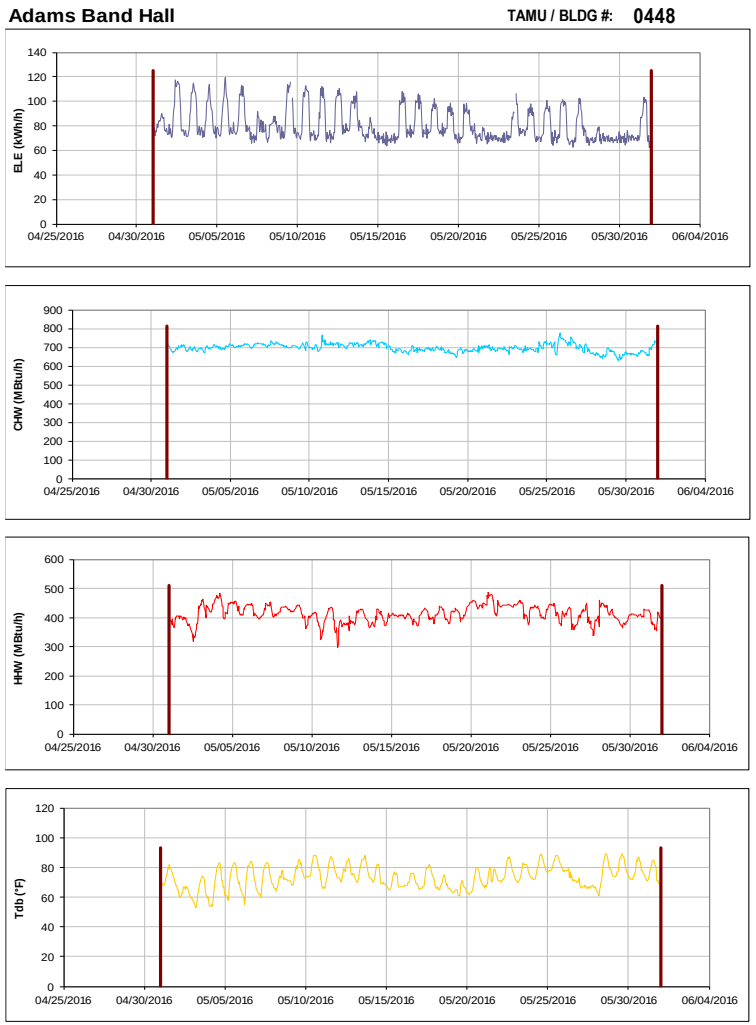


Figure III-70 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Adams Band Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-71 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Biological Sciences Building - West during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

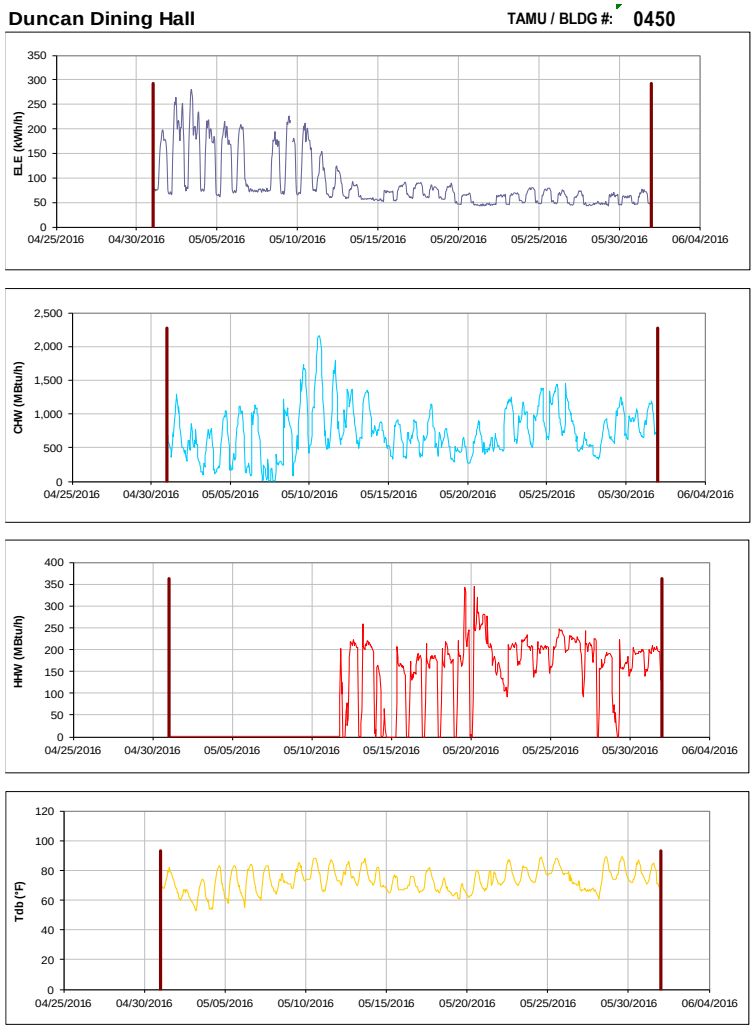


Figure III-72 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Duncan Dining Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

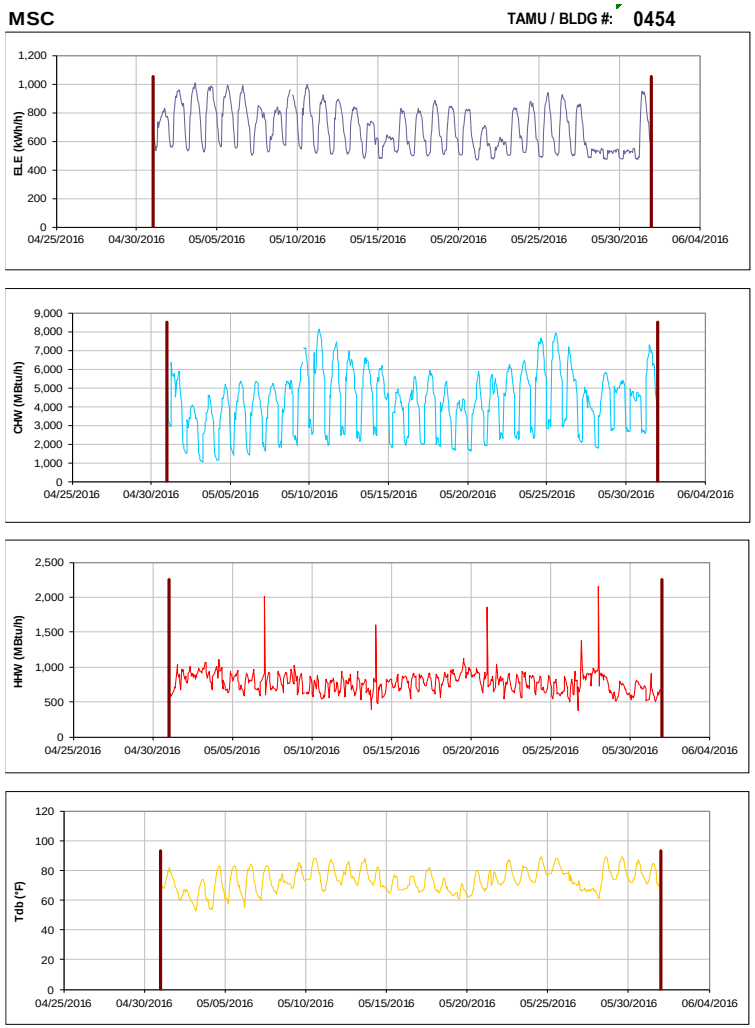


Figure III-73 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for MSC during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

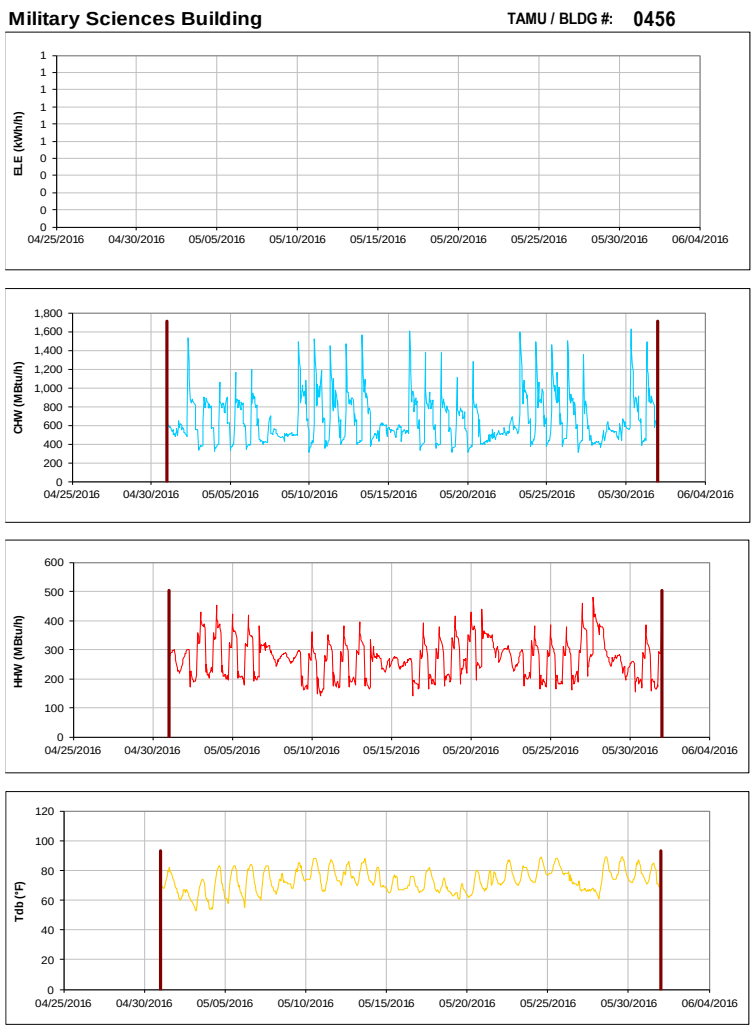


Figure III-74 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Military Sciences Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

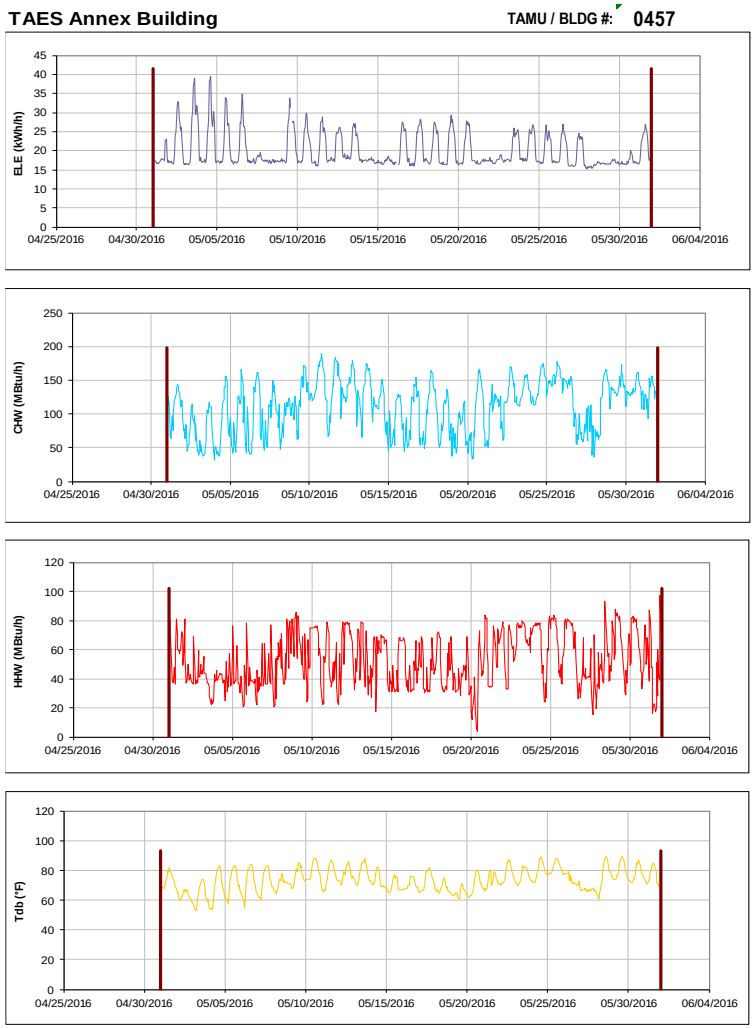


Figure III-75 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for TAES Annex Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

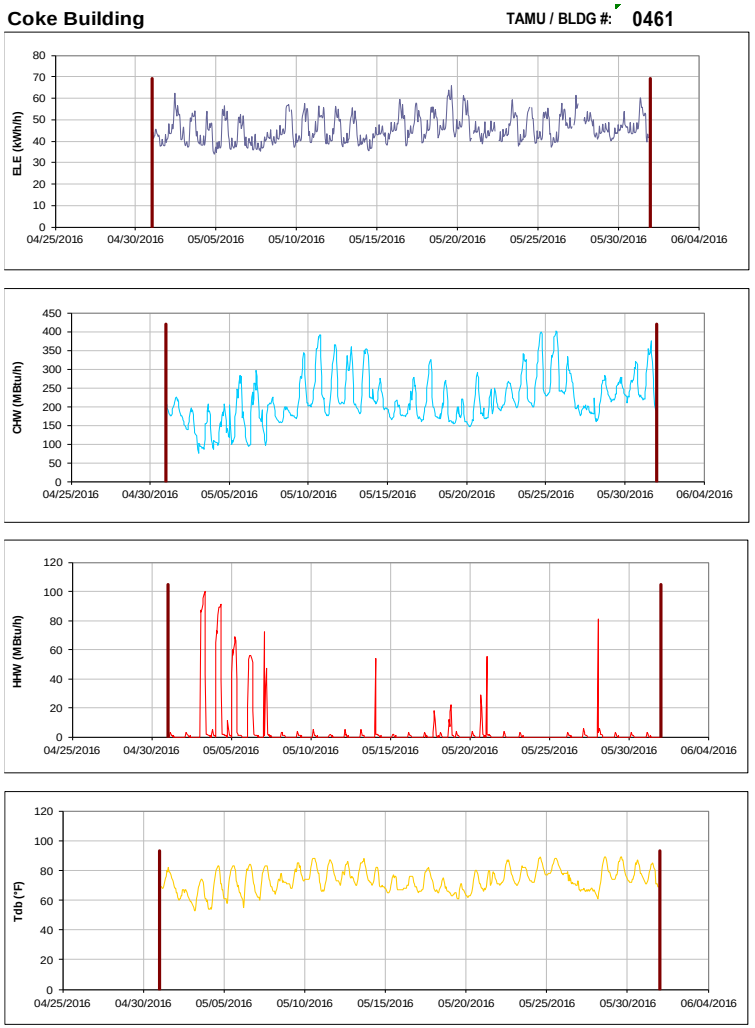


Figure III-76 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Coke Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

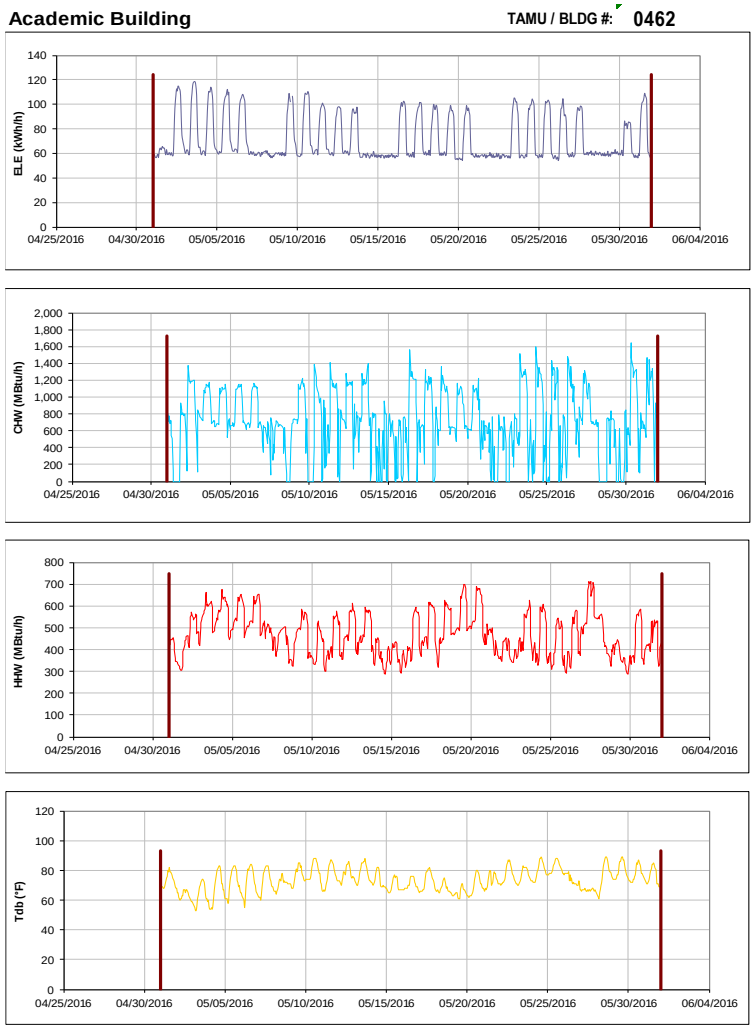


Figure III-77 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Academic Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

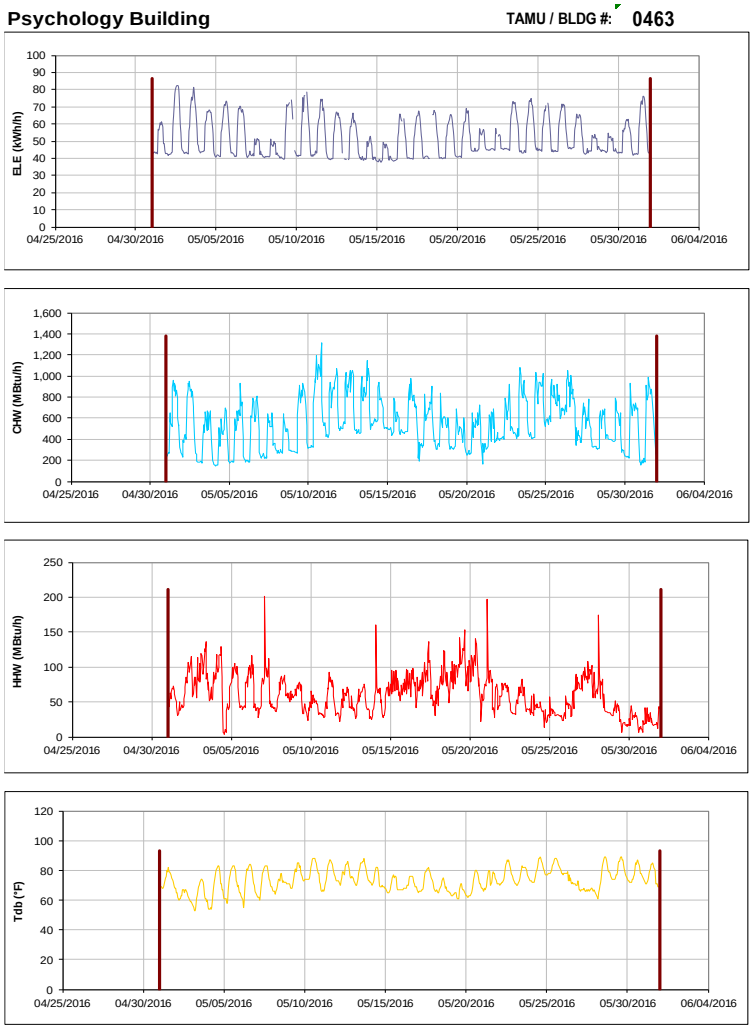


Figure III-78 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Psychology Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

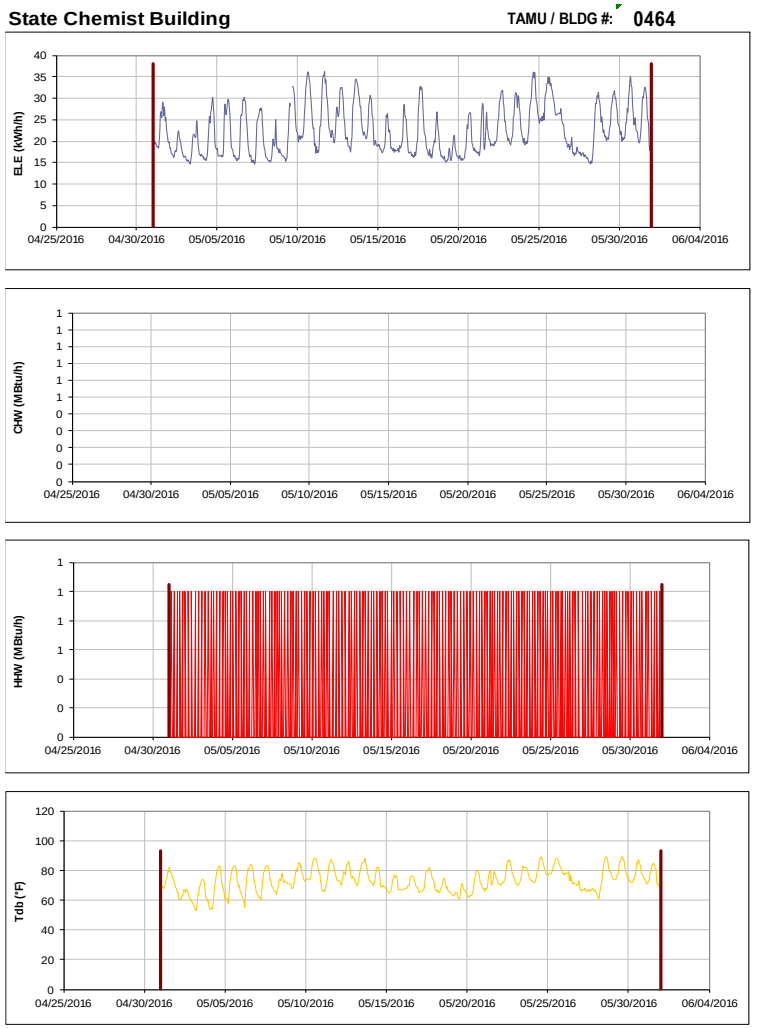


Figure III-79 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for State Chemist Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

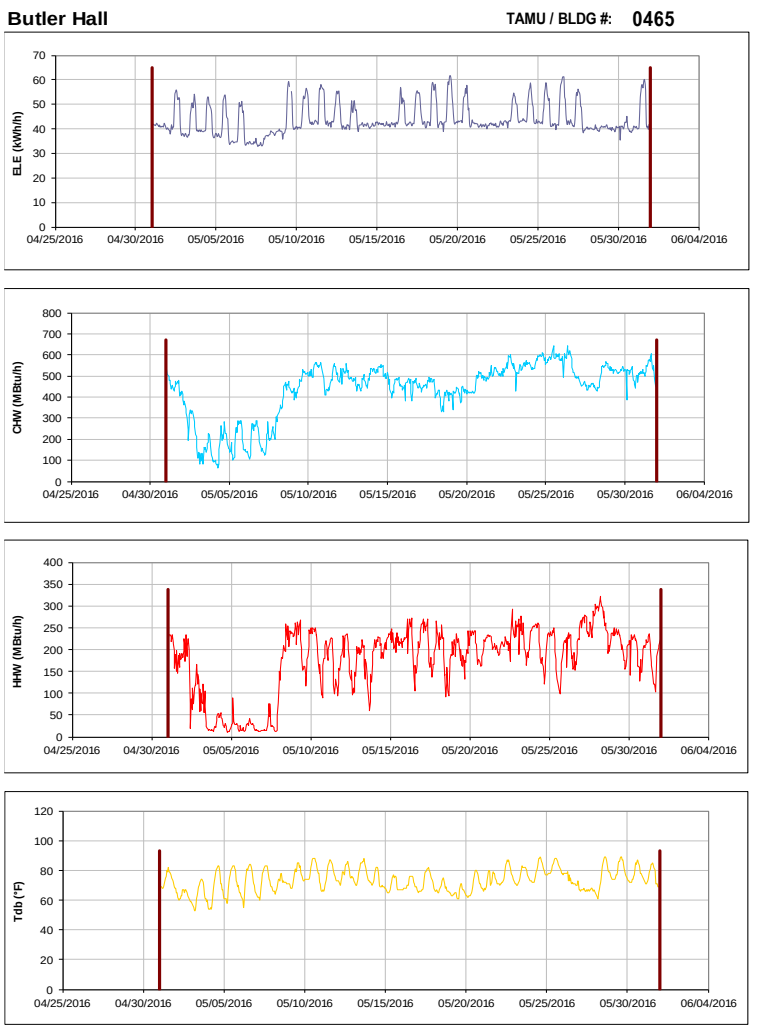


Figure III-80 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Butler Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

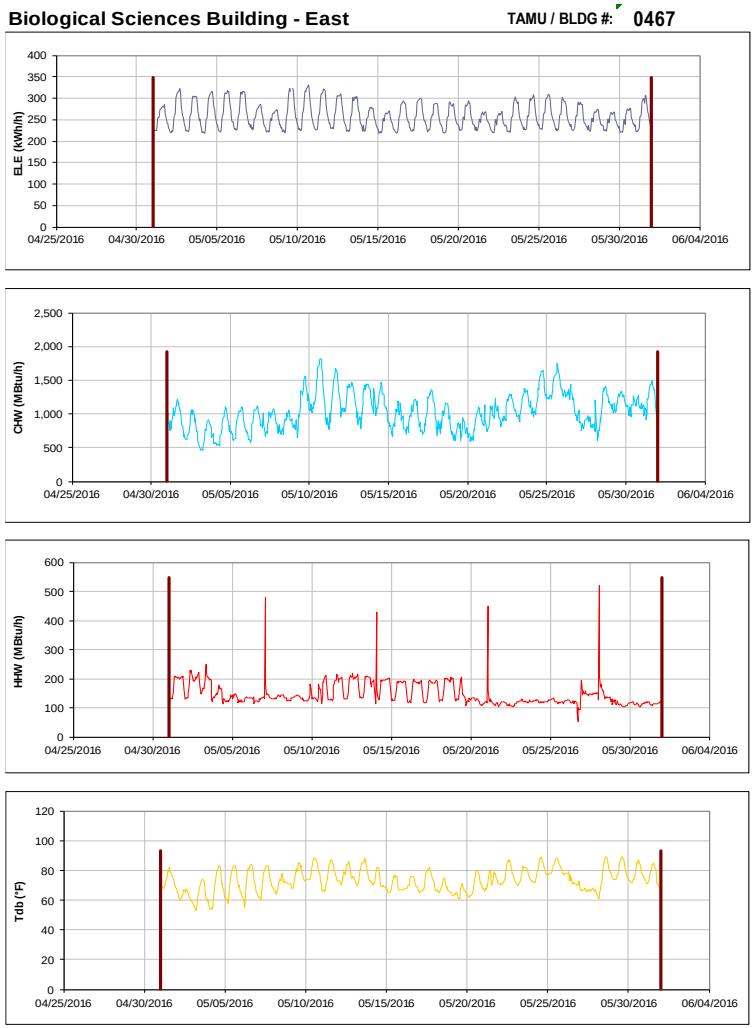


Figure III-81 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Biological Sciences Building - East during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

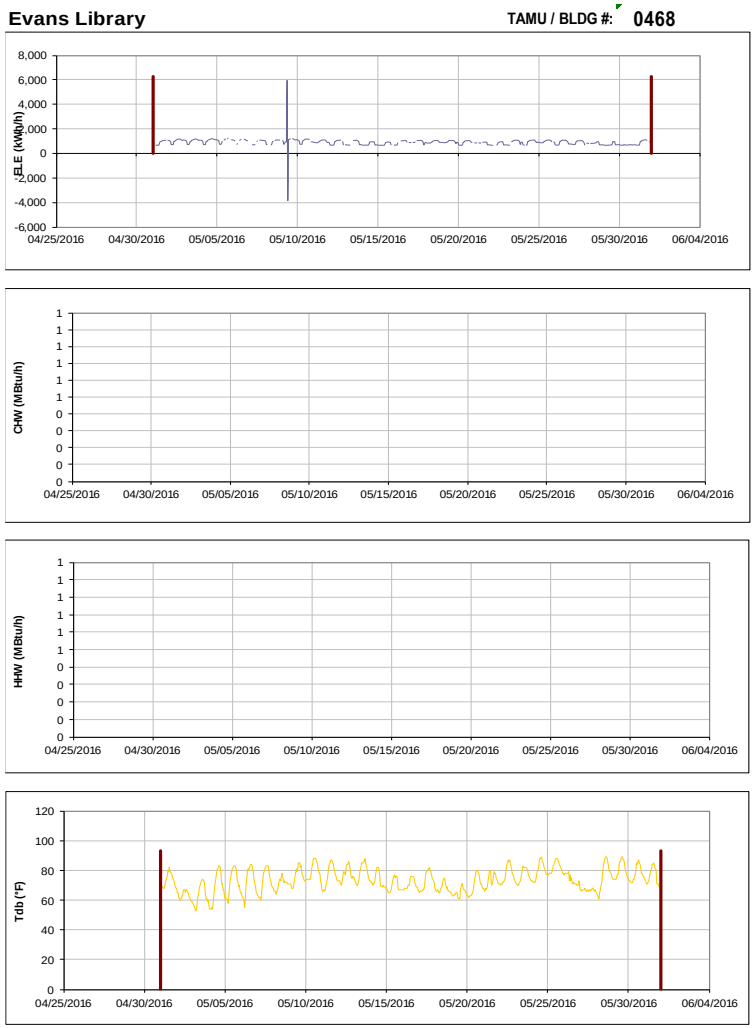


Figure III-82 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Evans Library during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-83 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Central Campus Parking Garage during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

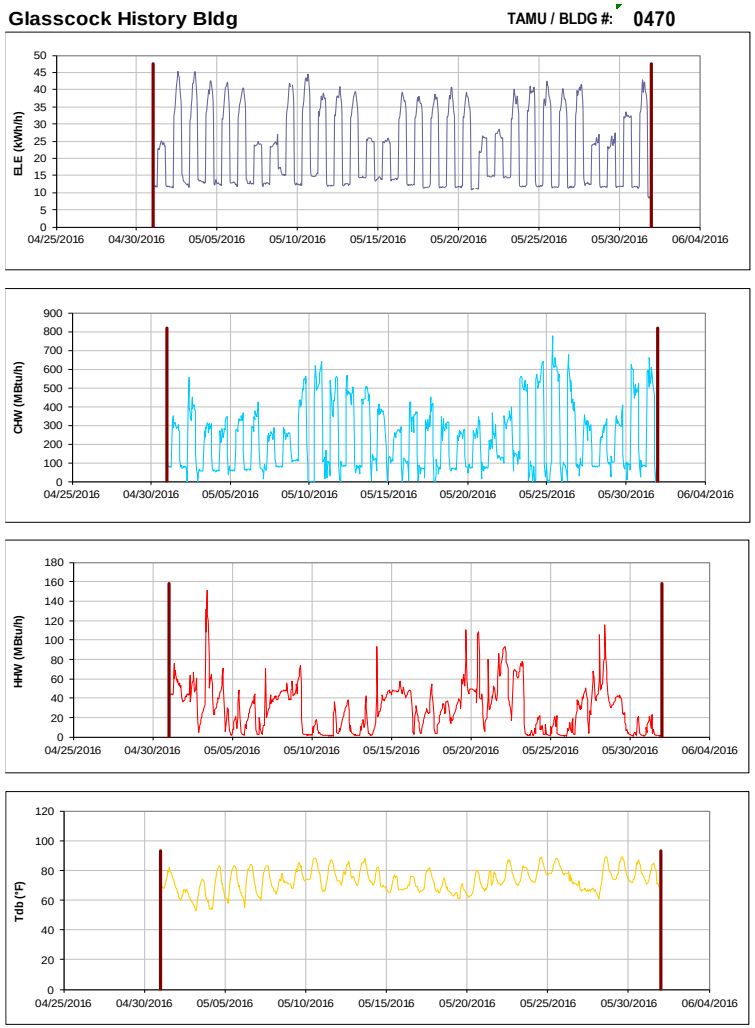


Figure III-84 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Glasscock History Bldg during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-85 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Pavilion during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

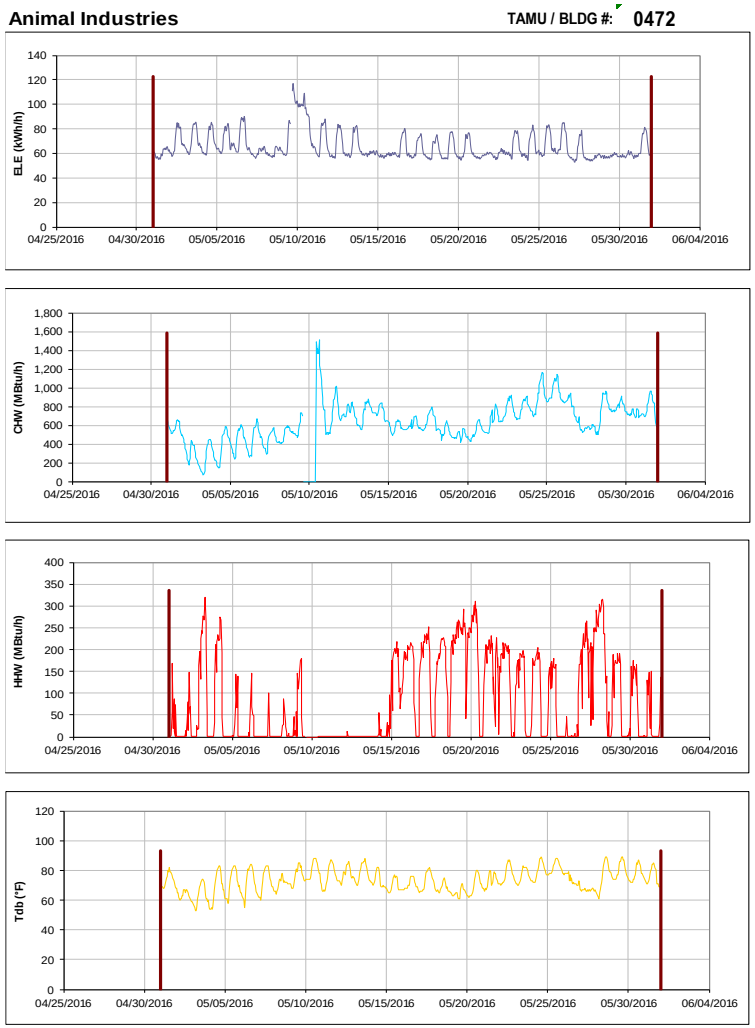


Figure III-86 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Animal Industries during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

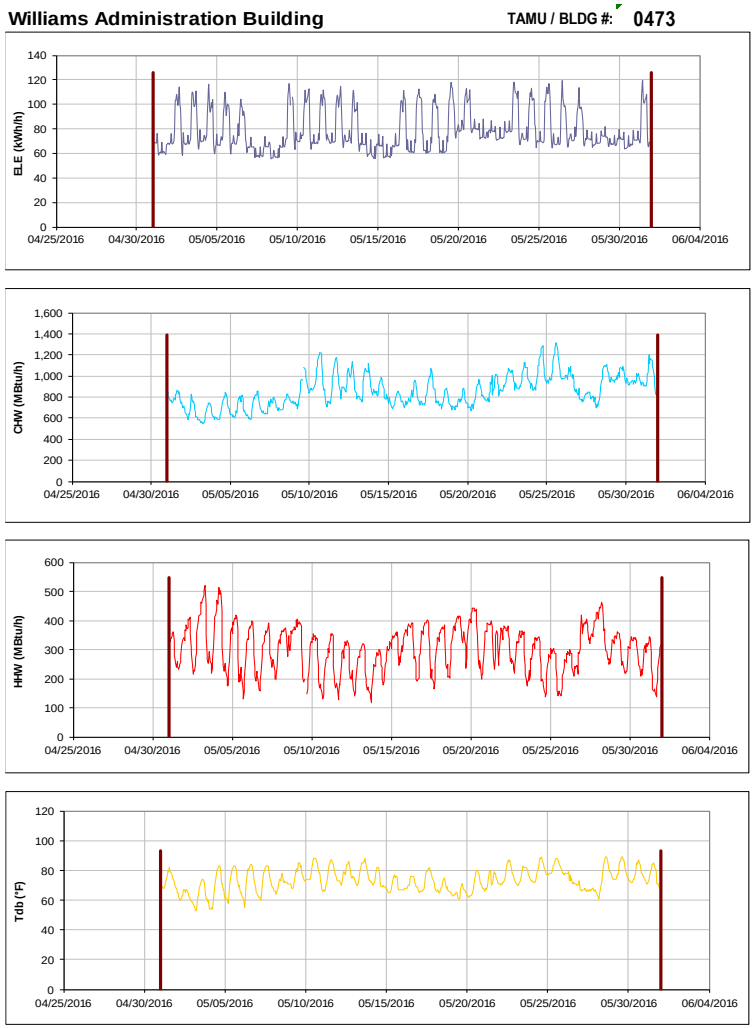


Figure III-87 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Williams Administration Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-88 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for YMCA Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

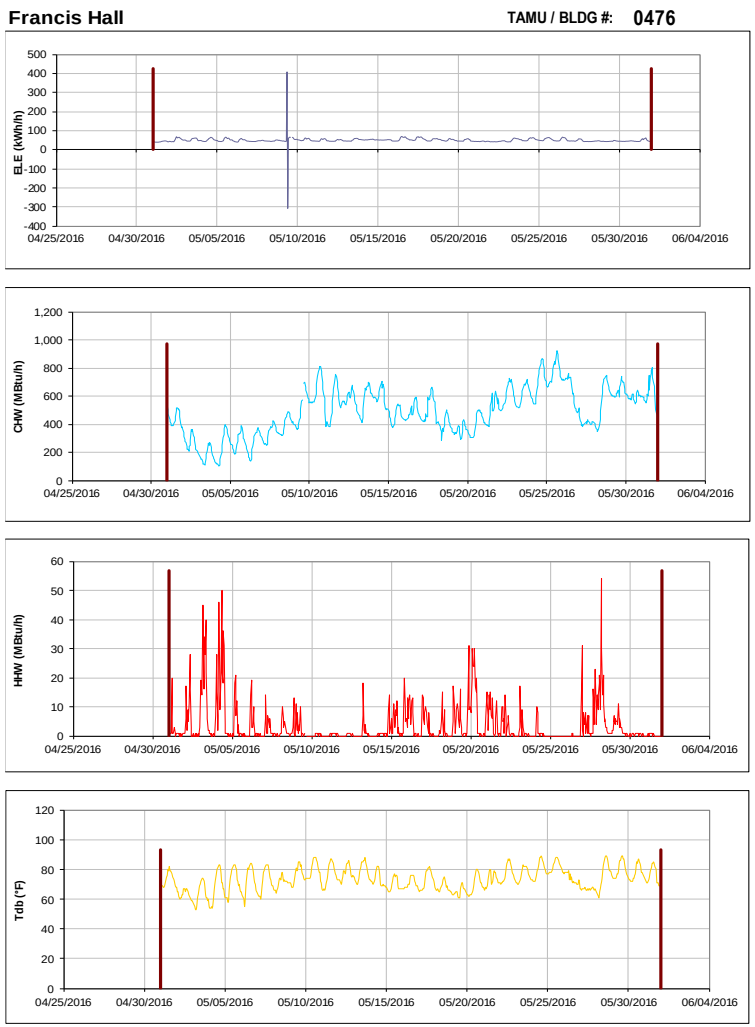


Figure III-89 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Francis Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

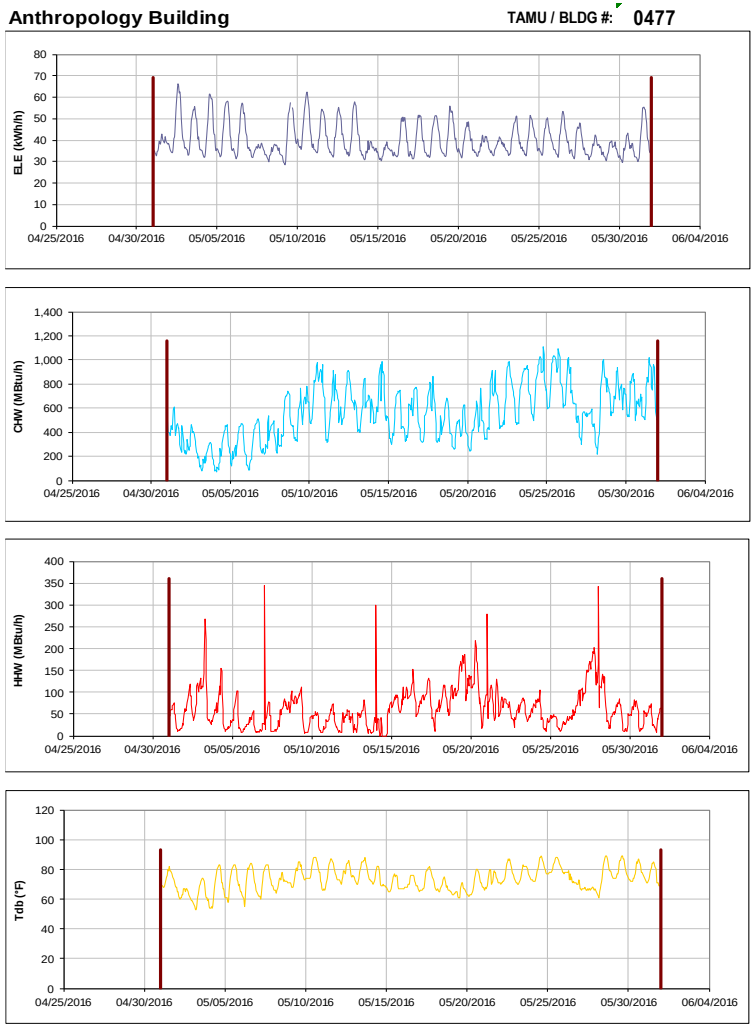


Figure III-90 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Anthropology Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

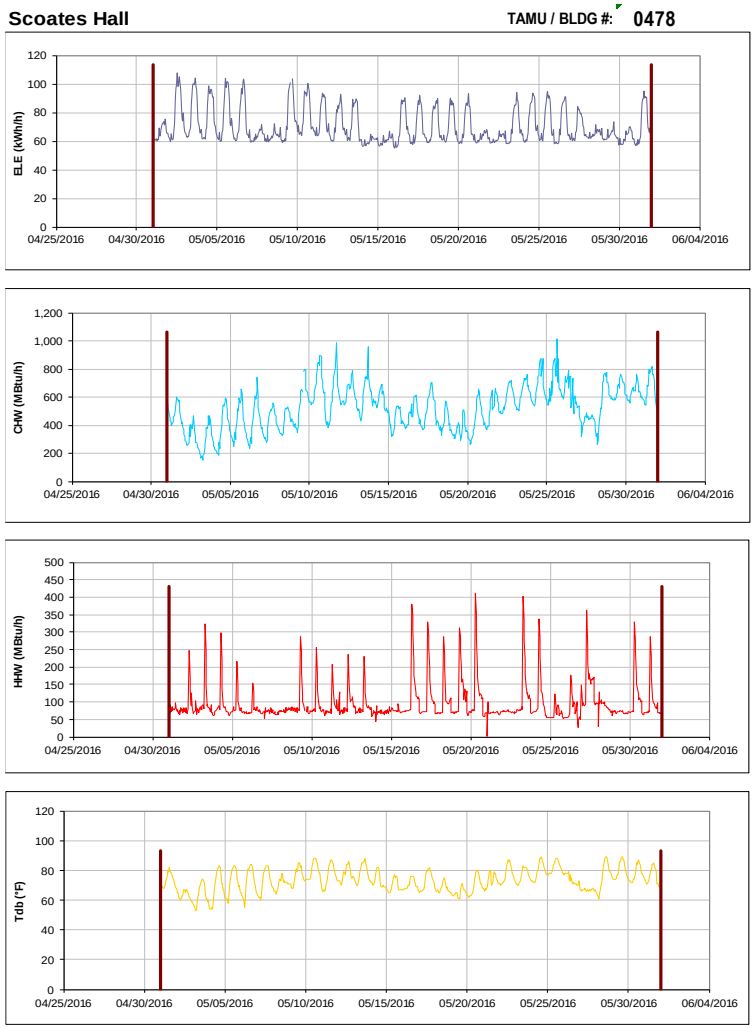


Figure III-91 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Scoates Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

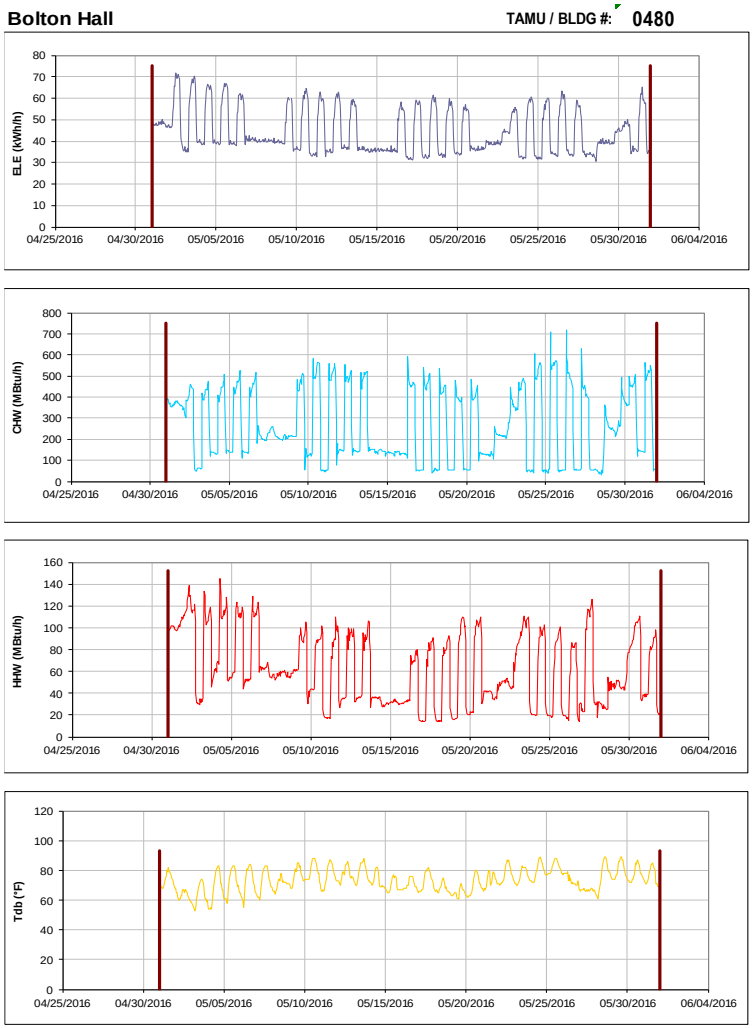


Figure III-92 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Bolton Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

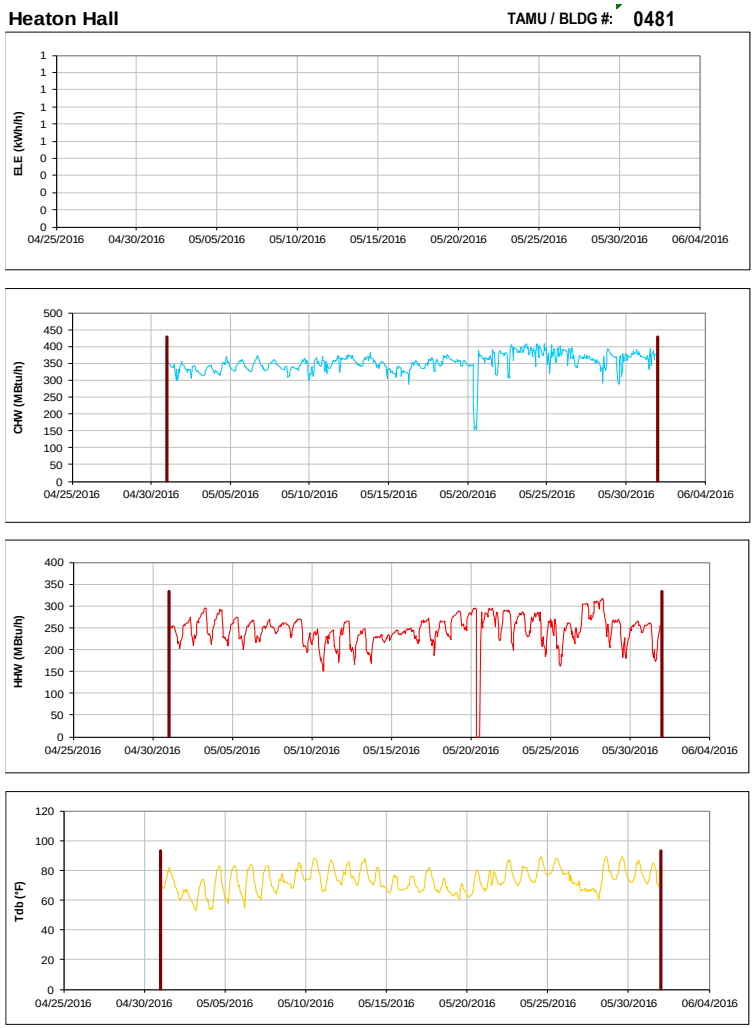


Figure III-93 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Heaton Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

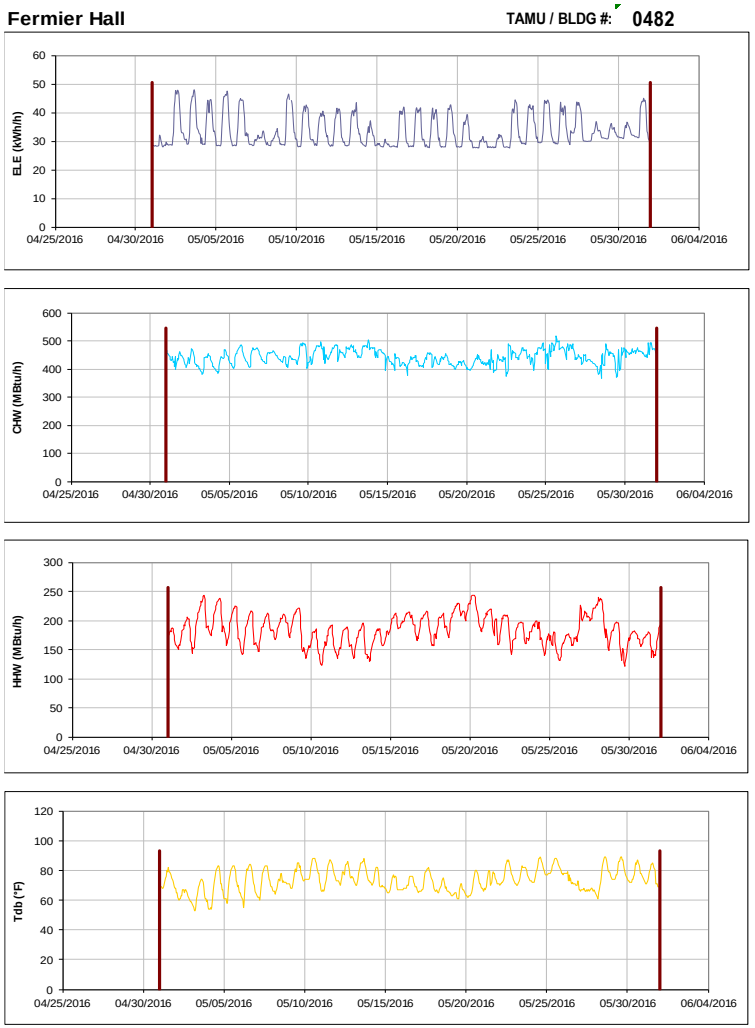


Figure III-94 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Fermier Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

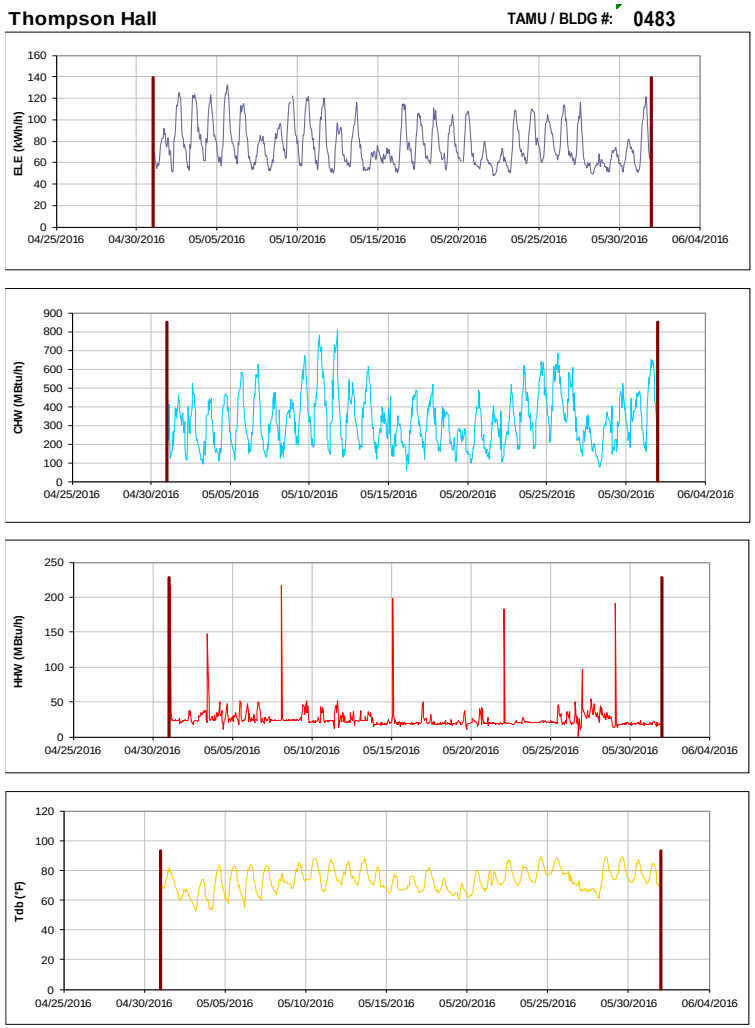


Figure III-95 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Thompson Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-96 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Chemistry Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

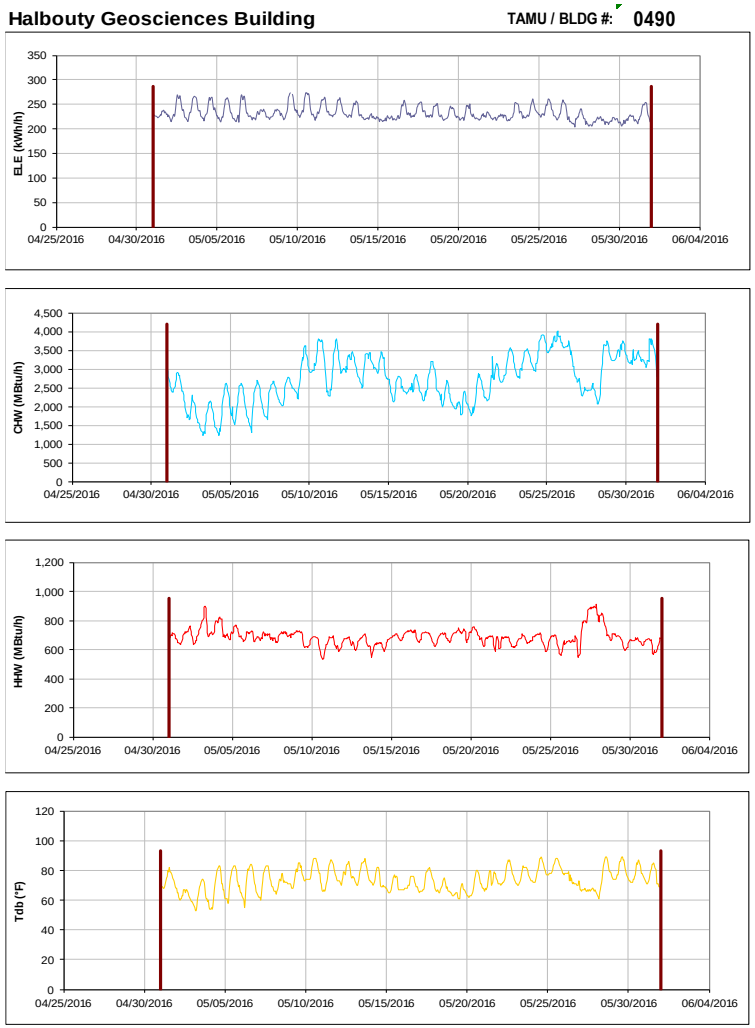


Figure III-97 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Halbouty Geosciences Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

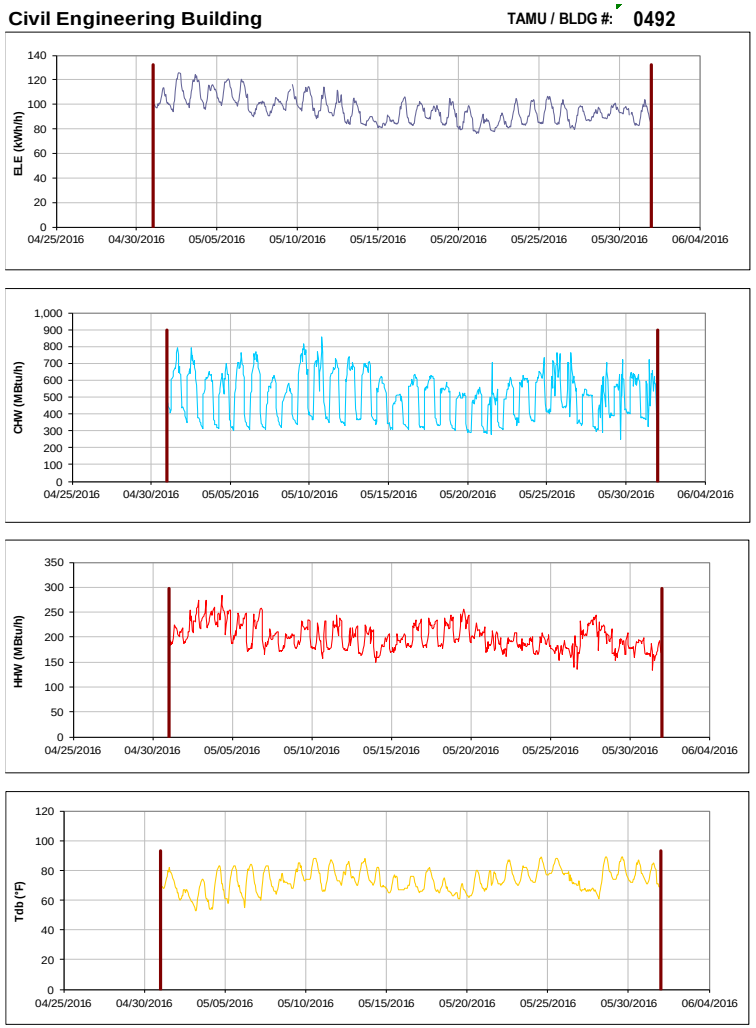


Figure III-98 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Civil Engineering Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

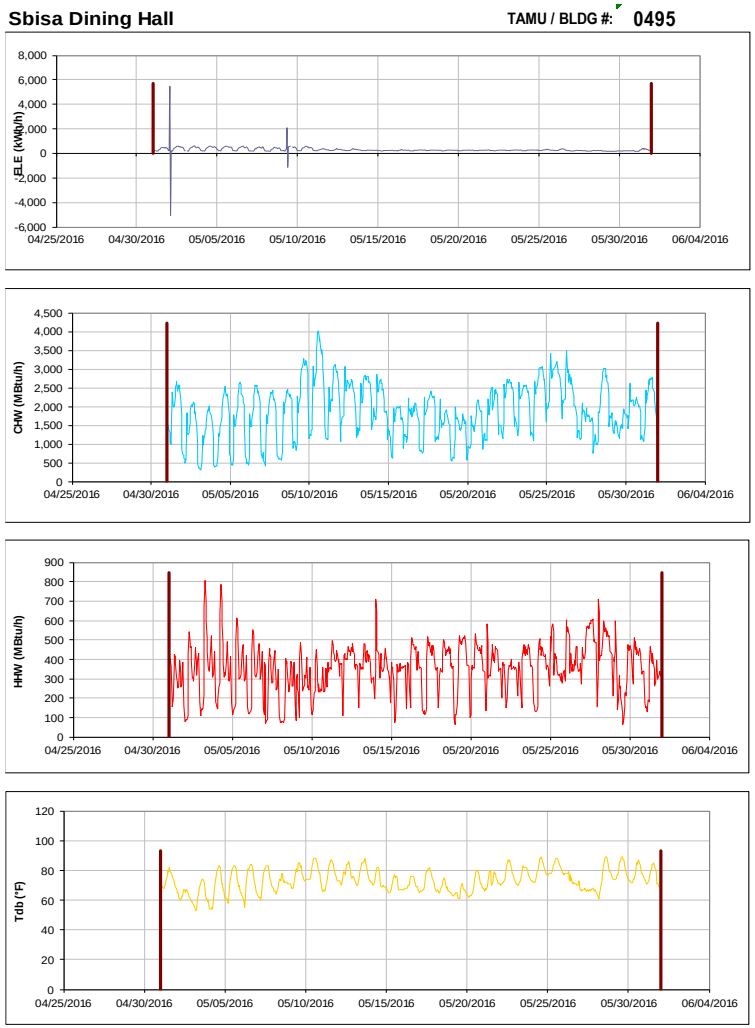


Figure III-99 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Sbisa Dining Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

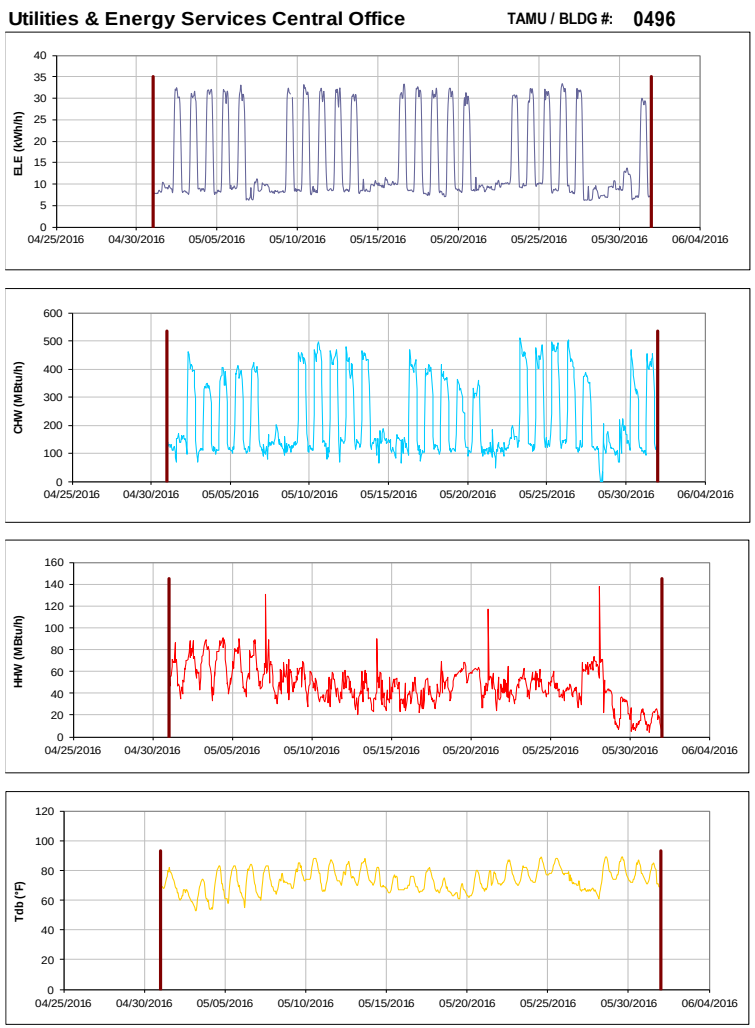


Figure III-100 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Utilities & Energy Services Central Office during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

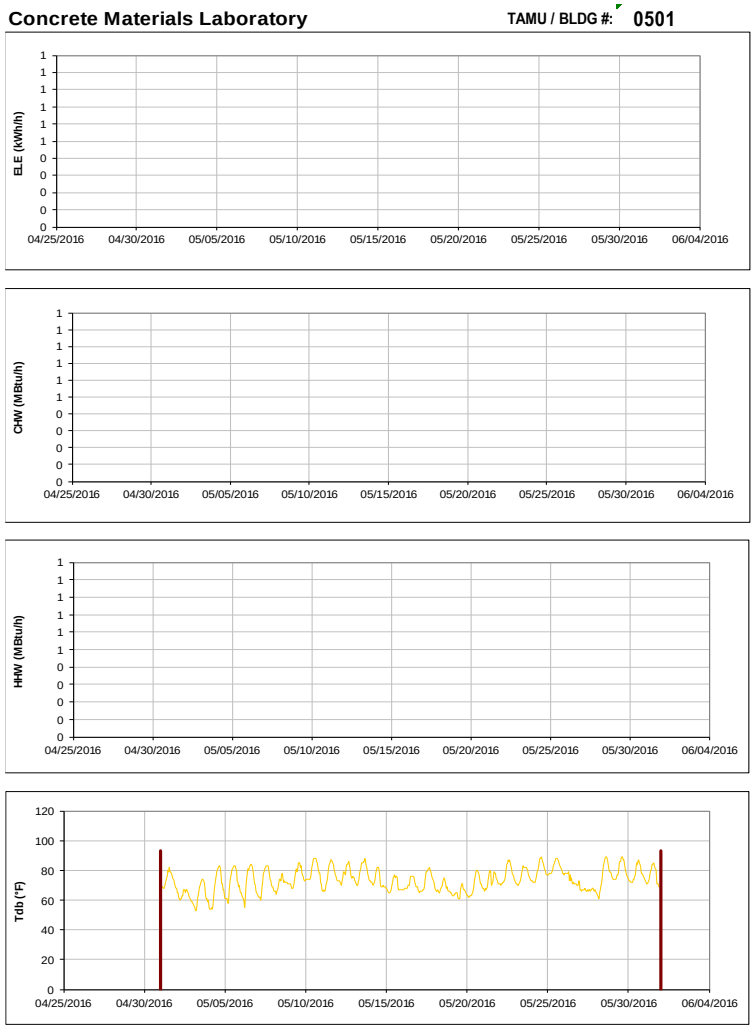


Figure III-101 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Concrete Materials Laboratory during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

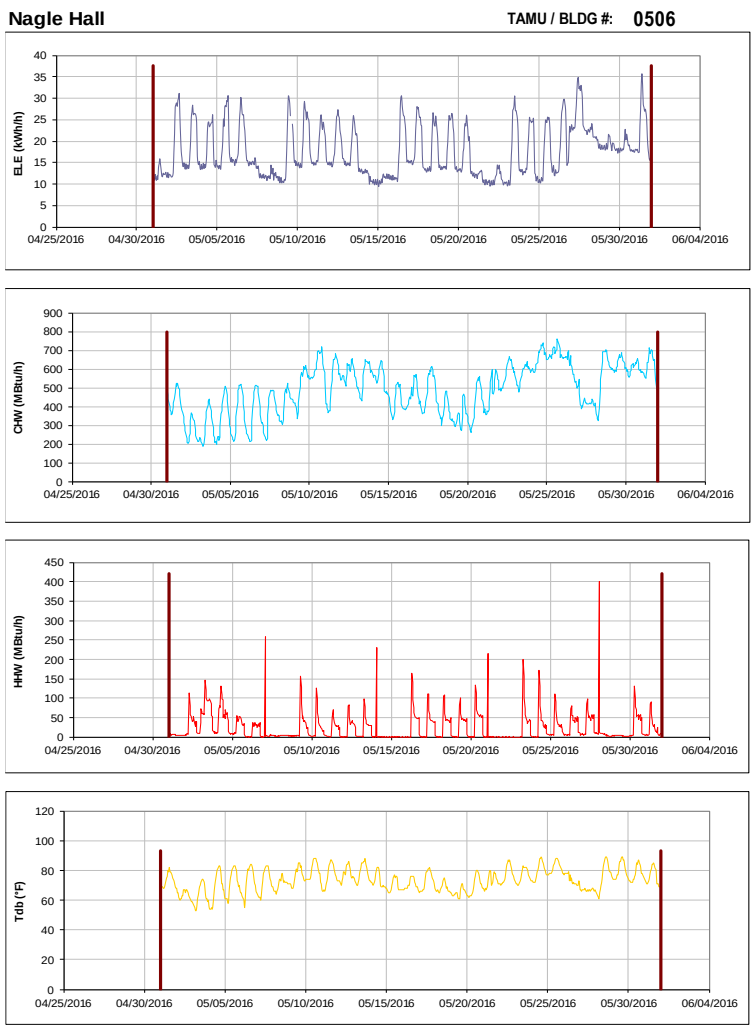


Figure III-102 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Nagle Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

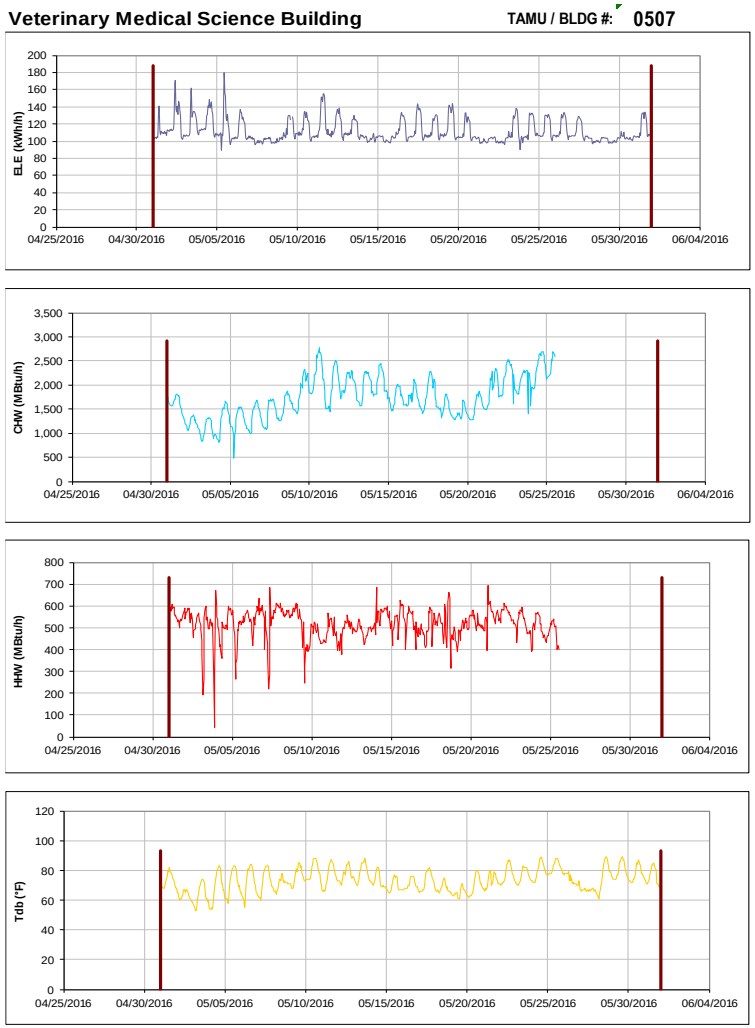


Figure III-103 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Veterinary Medical Science Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

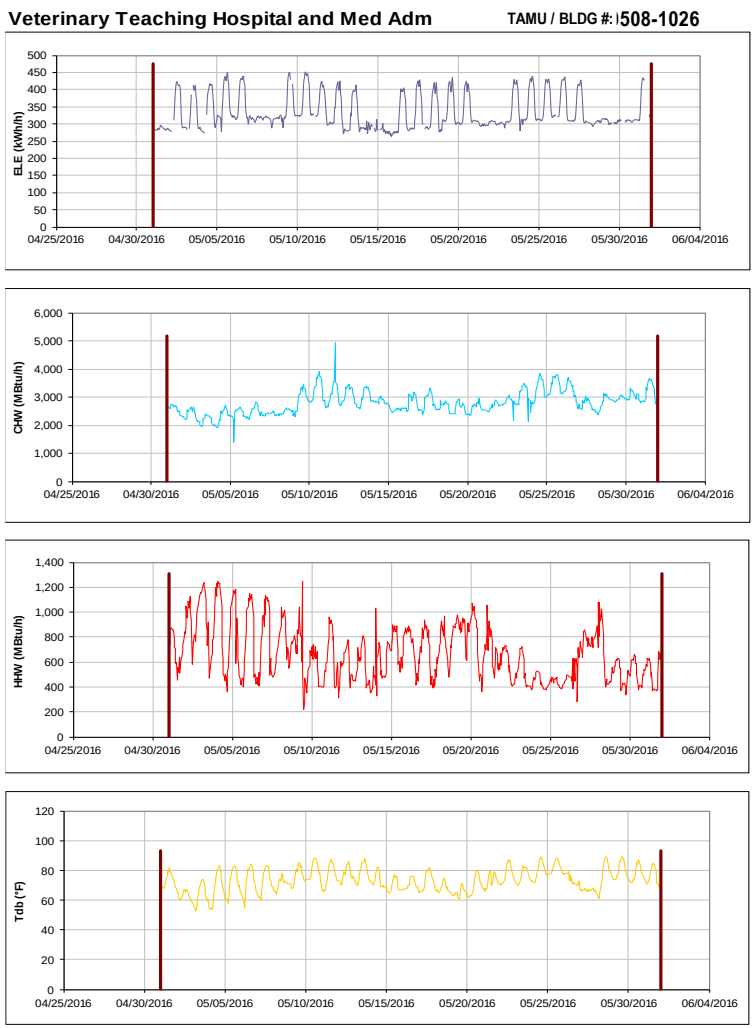


Figure III-104 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Veterinary Teaching Hospital and Med Adm during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

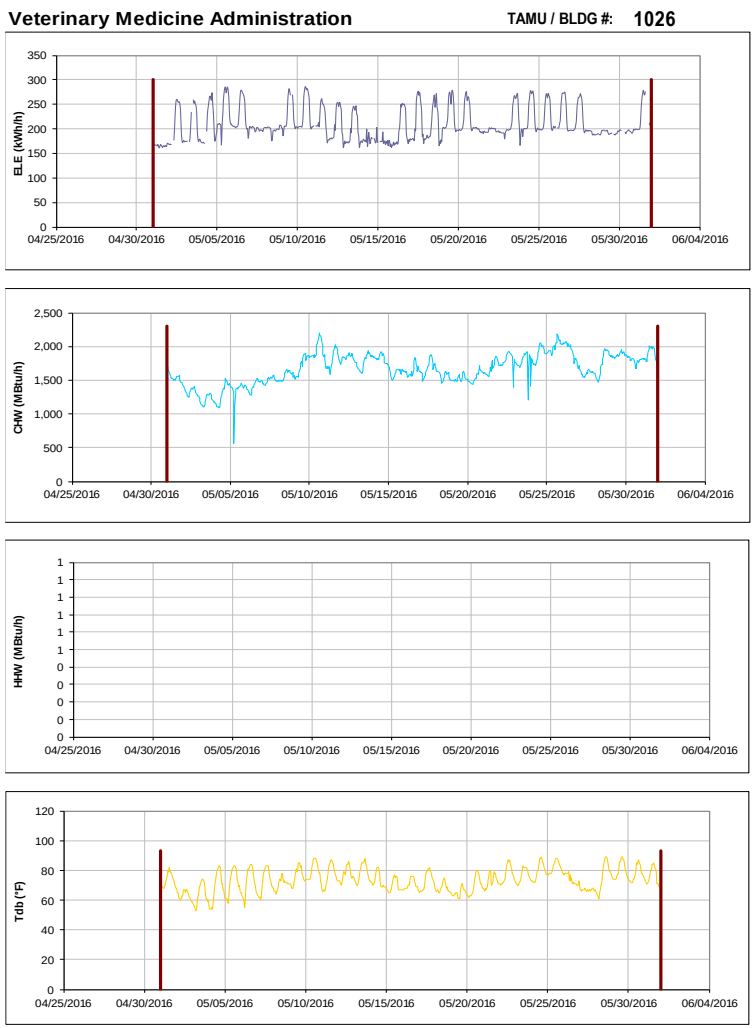


Figure III-105 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Veterinary Medicine Administration during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

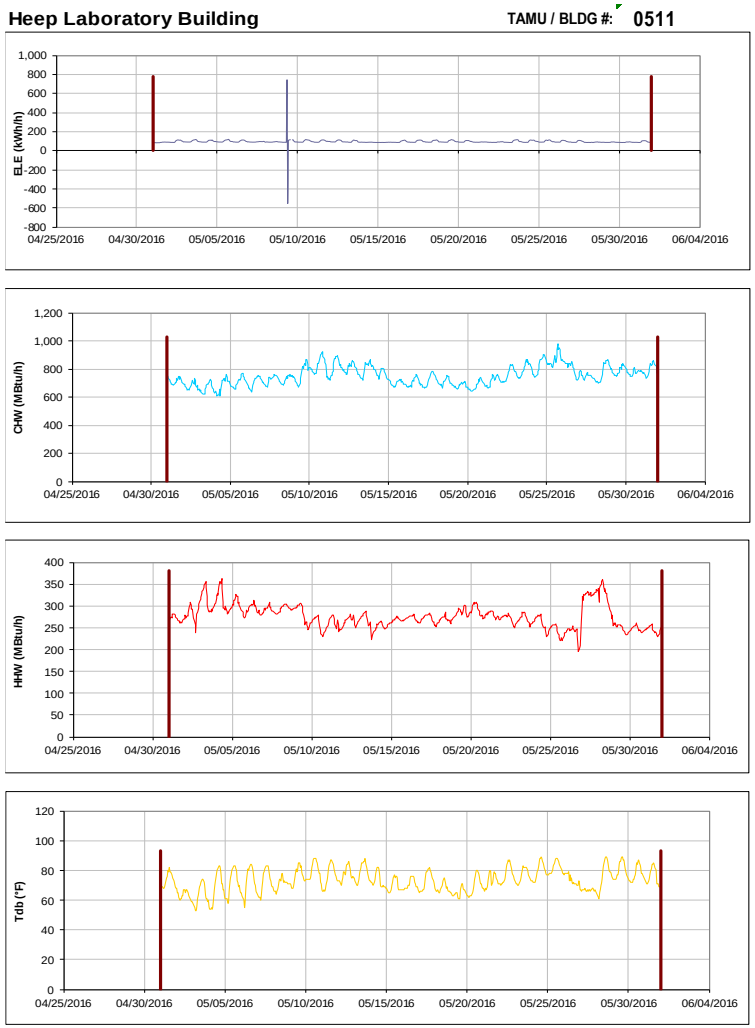


Figure III-106 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Heep Laboratory Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

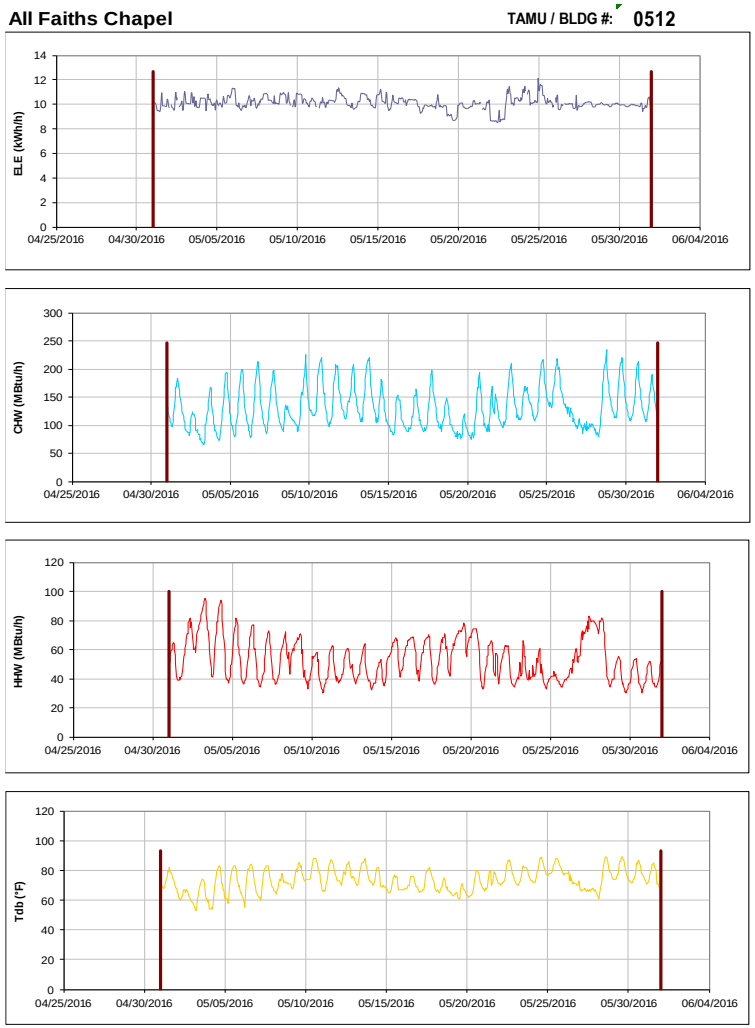


Figure III-107 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for All Faiths Chapel during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

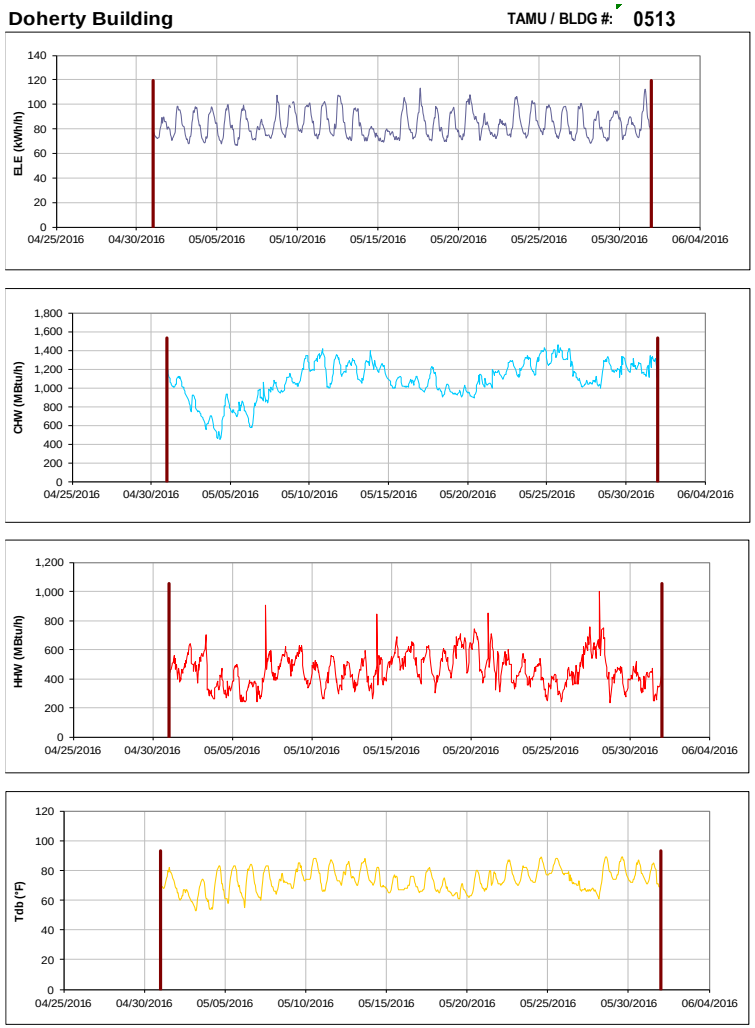


Figure III-108 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Doherty Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

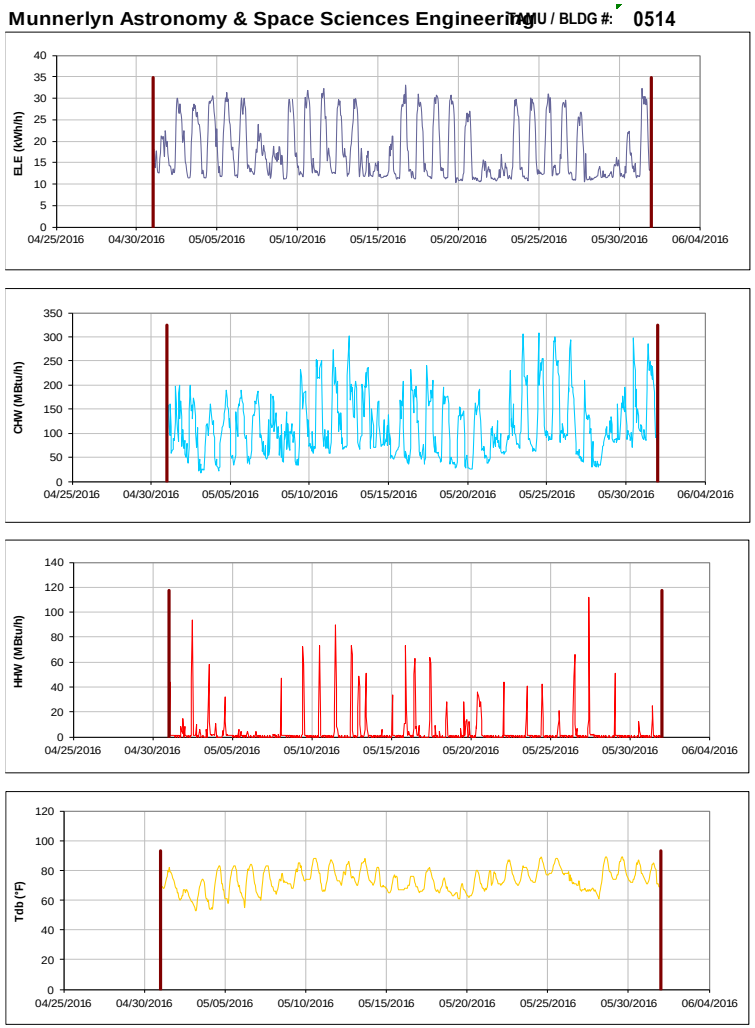


Figure III-109 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Munnerlyn Astronomy & Space Sciences Engineering during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

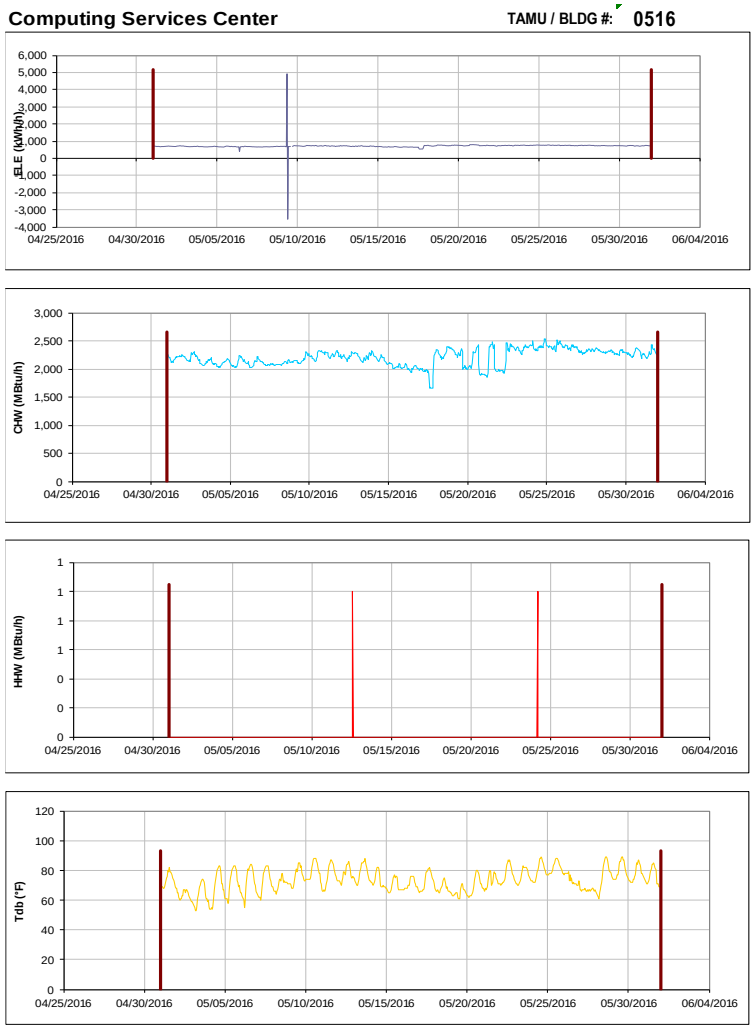


Figure III-110 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Computing Services Center during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

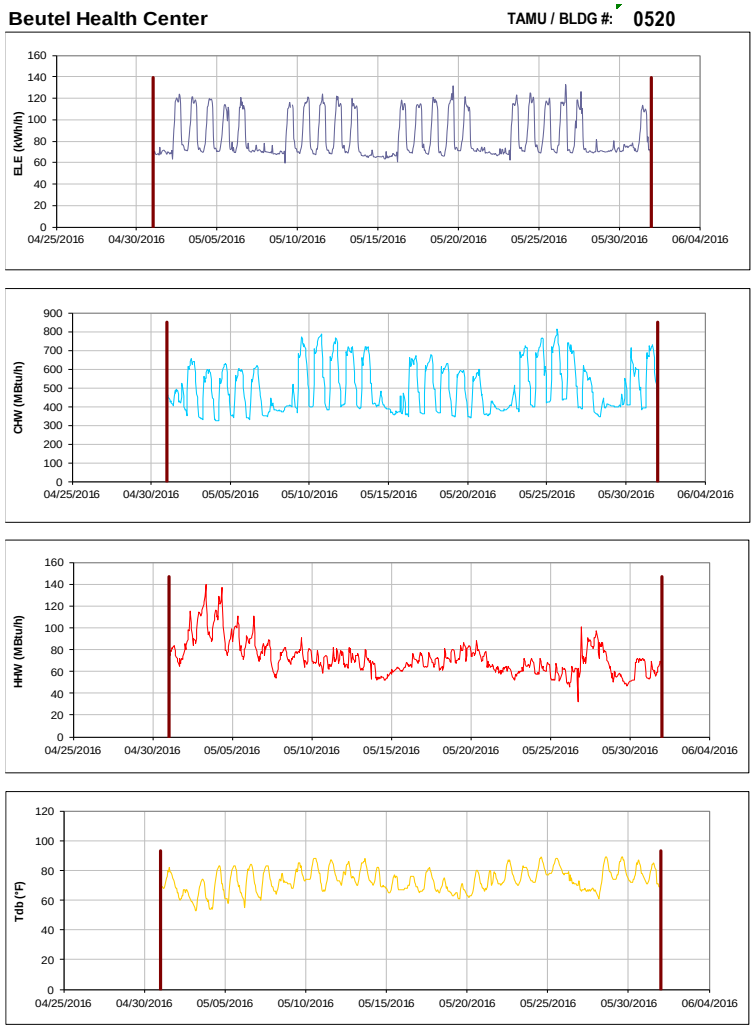


Figure III-111 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Beutel Health Center during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

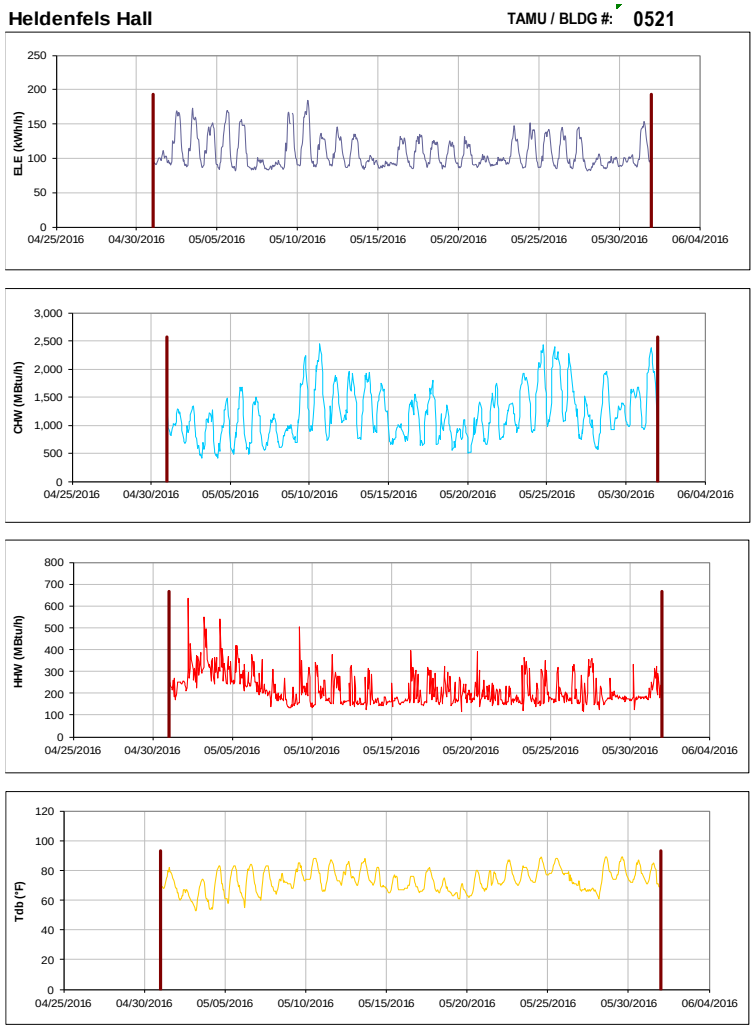


Figure III-112 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Heldenfels Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-113 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Blocker building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

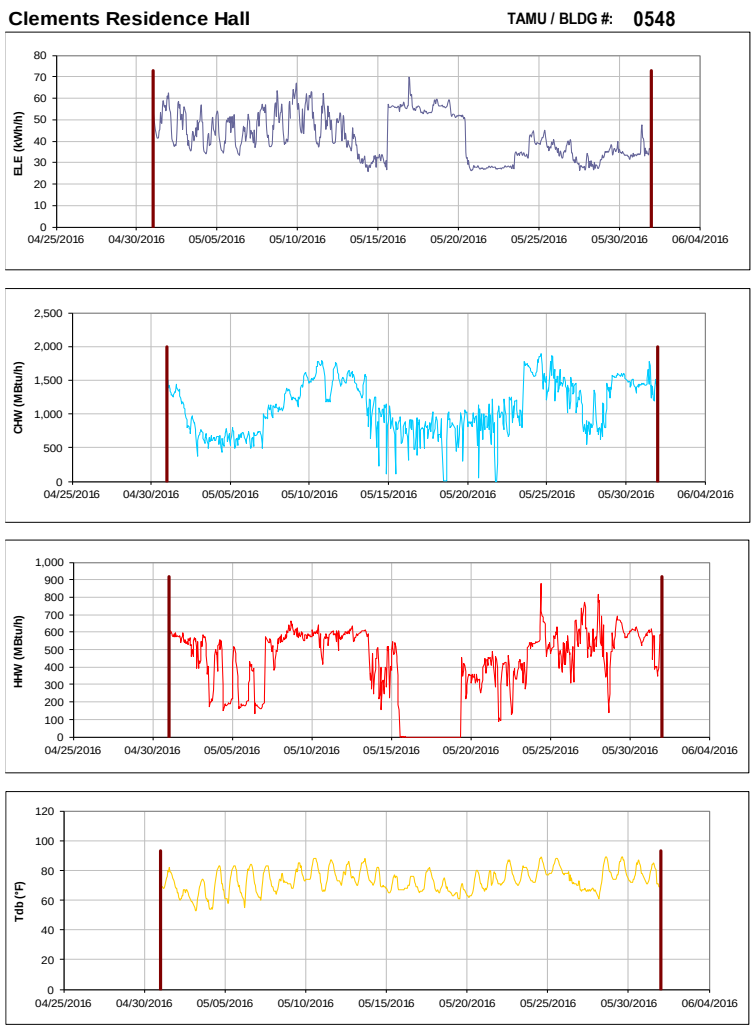


Figure III-114 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Clements Residence Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

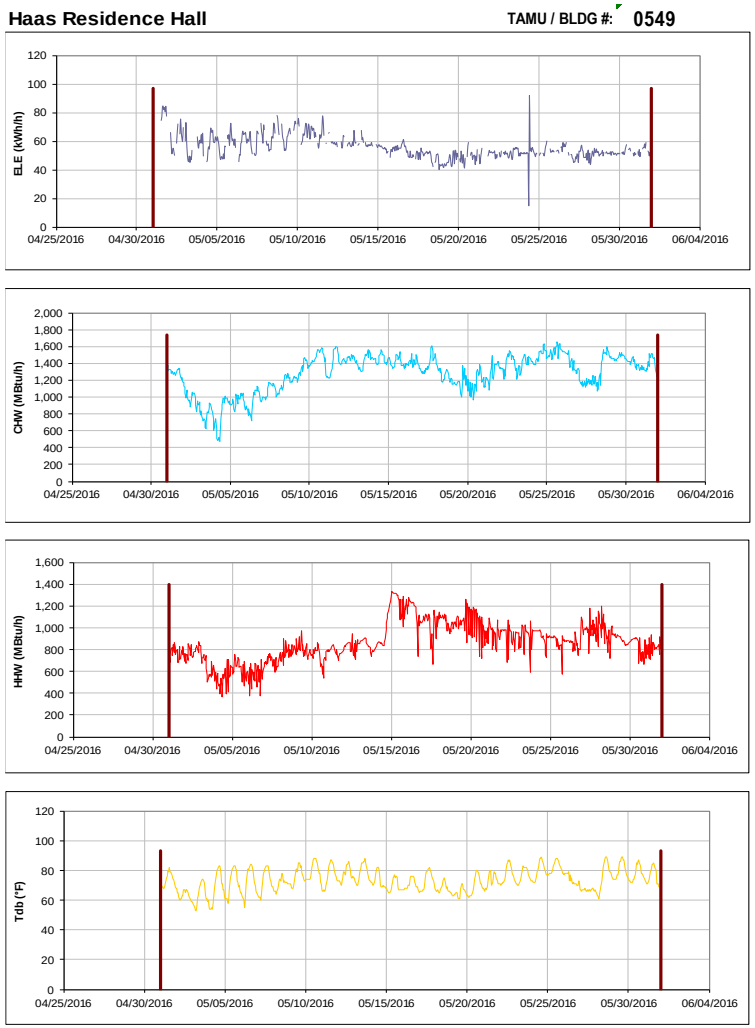


Figure III-115 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Haas Residence Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

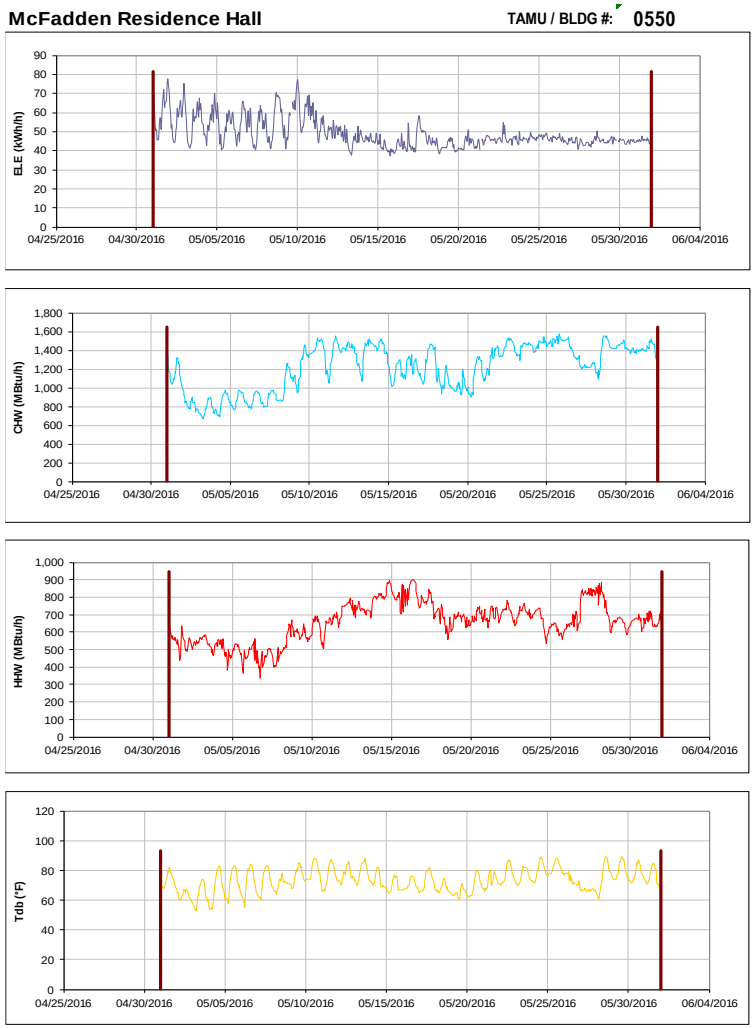


Figure III-116 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for McFadden Residence Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-117 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Neeley Residence Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-118 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Hobby Residence Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-119 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Wisenbaker Engineering Research Center during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

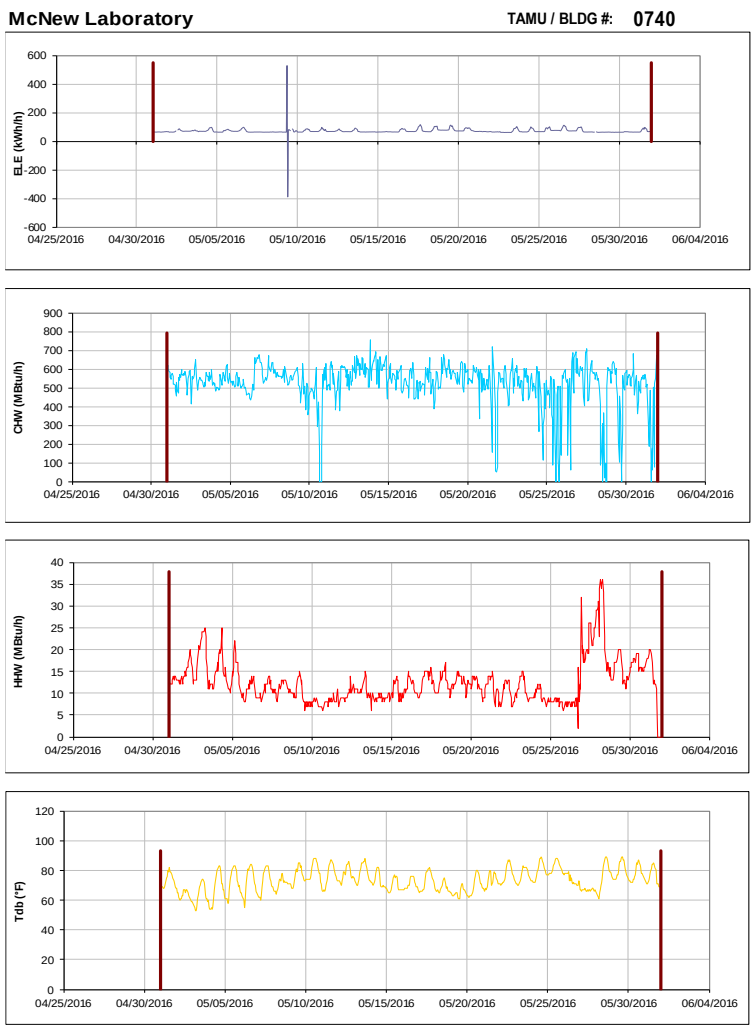


Figure III-120 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for McNew Laboratory during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

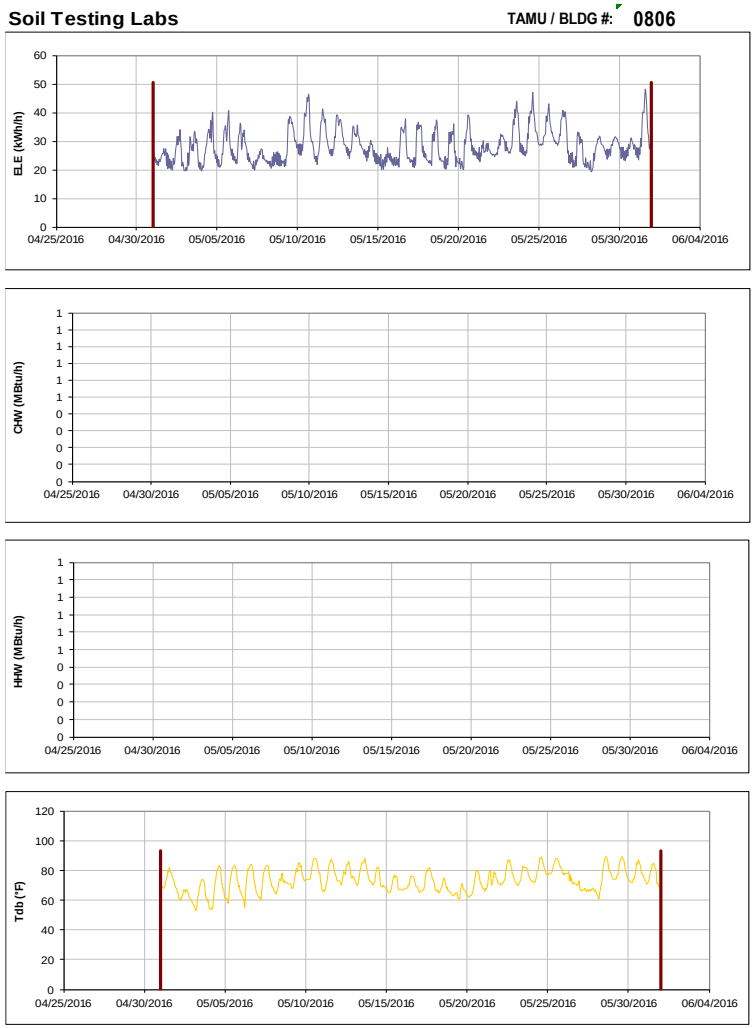


Figure III-121 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Soil Testing Labs during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

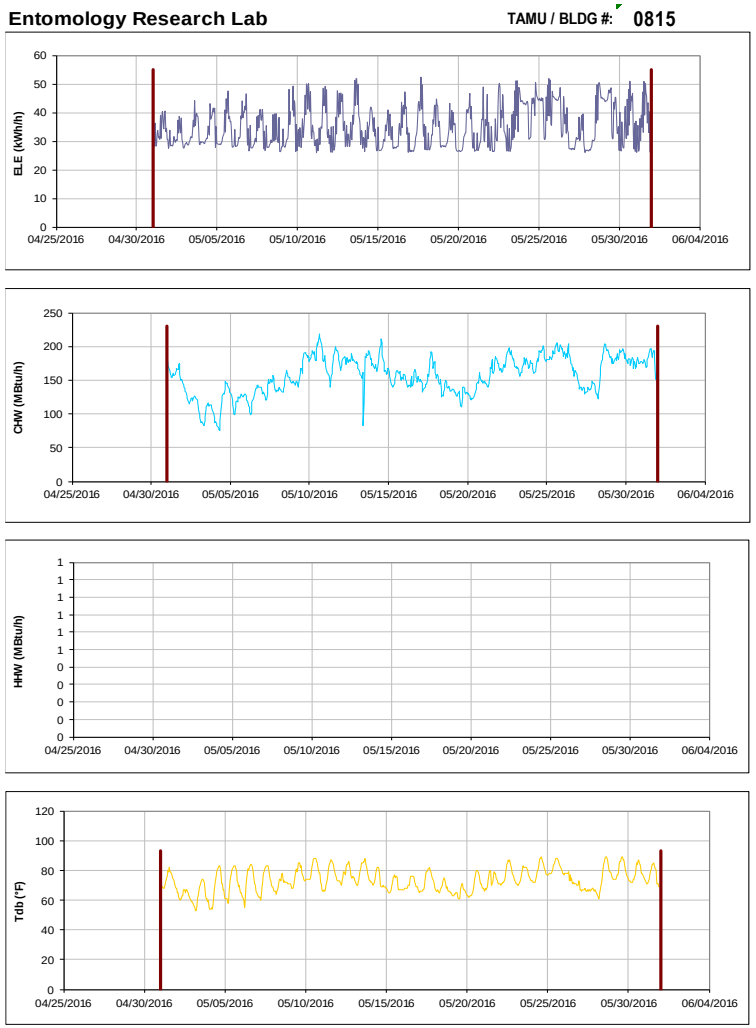


Figure III-122 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Entomology Research Lab during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

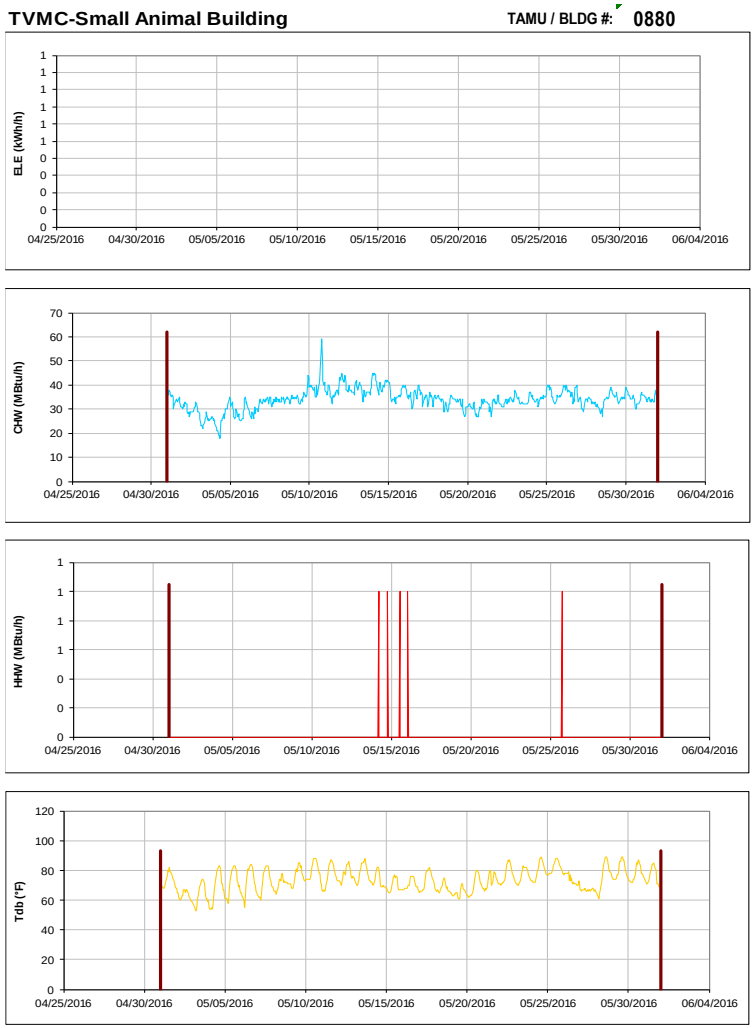


Figure III-123 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for TVMC-Small Animal Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

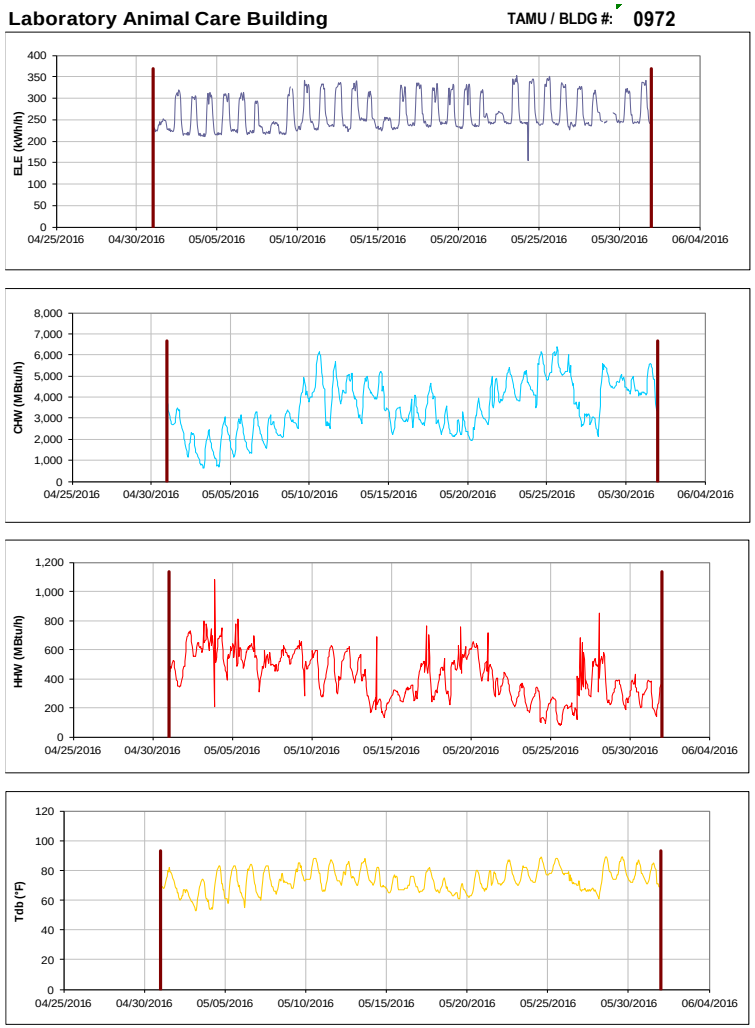


Figure III-124 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Laboratory Animal Care Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

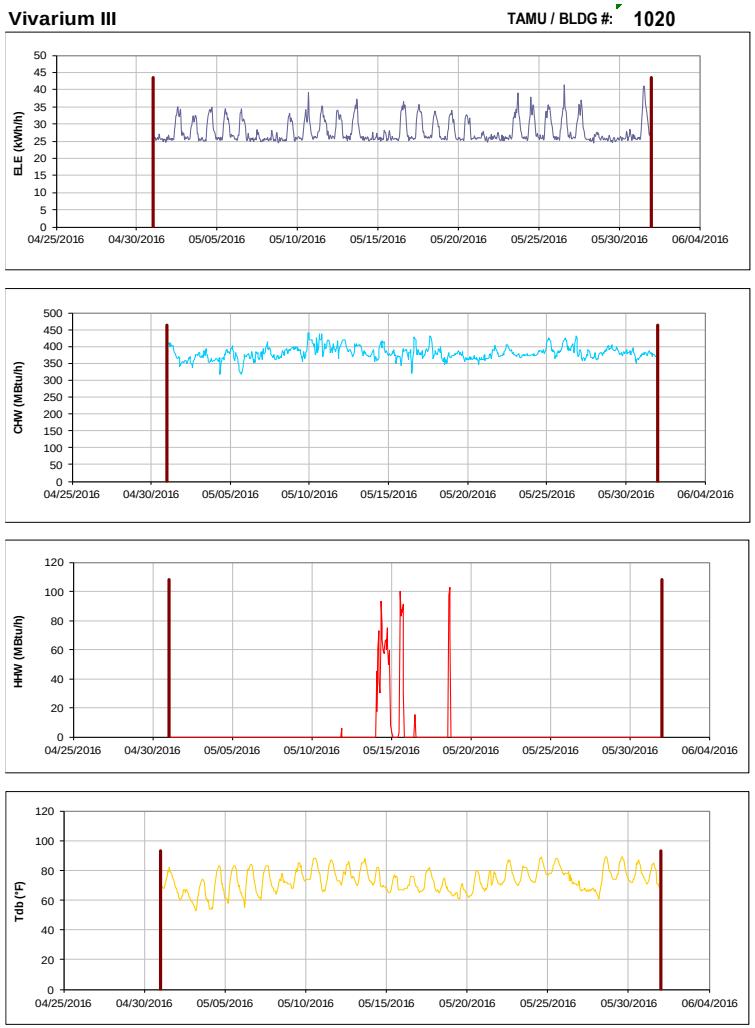


Figure III-125 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Vivarium III during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

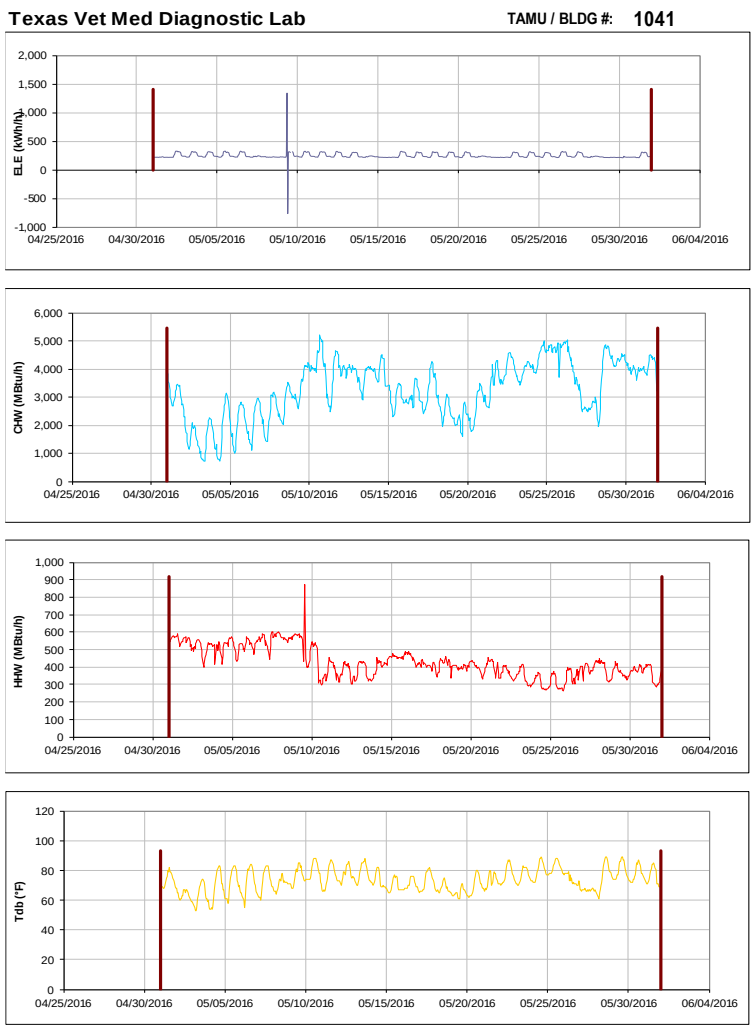


Figure III-126 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Texas Vet Med Diagnostic Lab during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

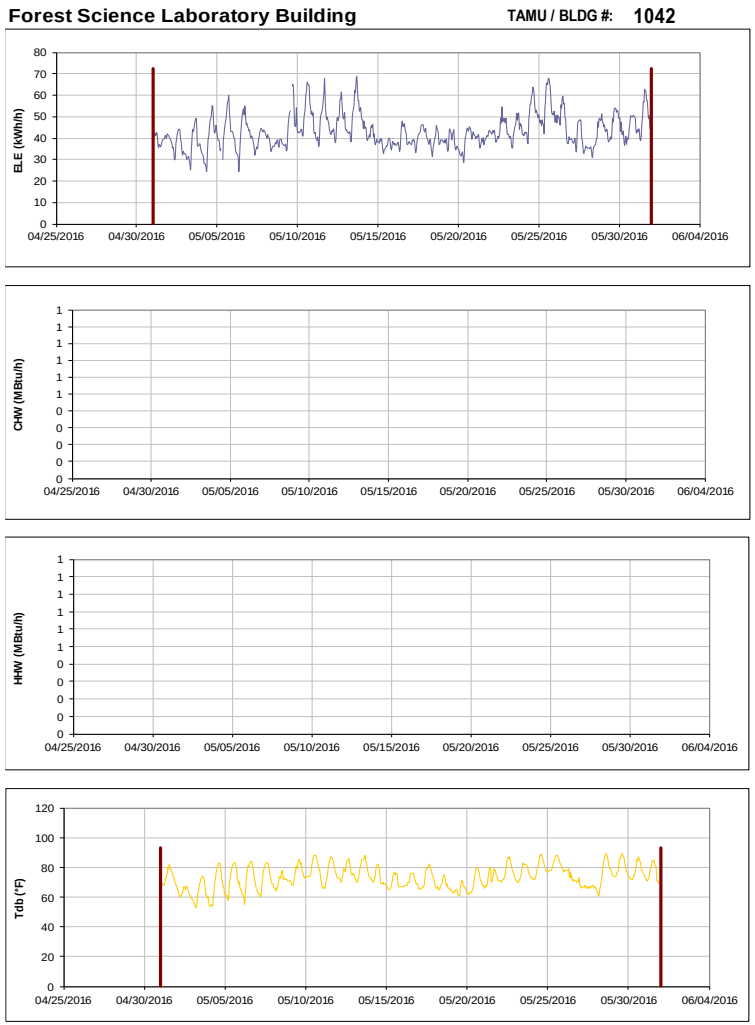


Figure III-127 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Forest Science Laboratory Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

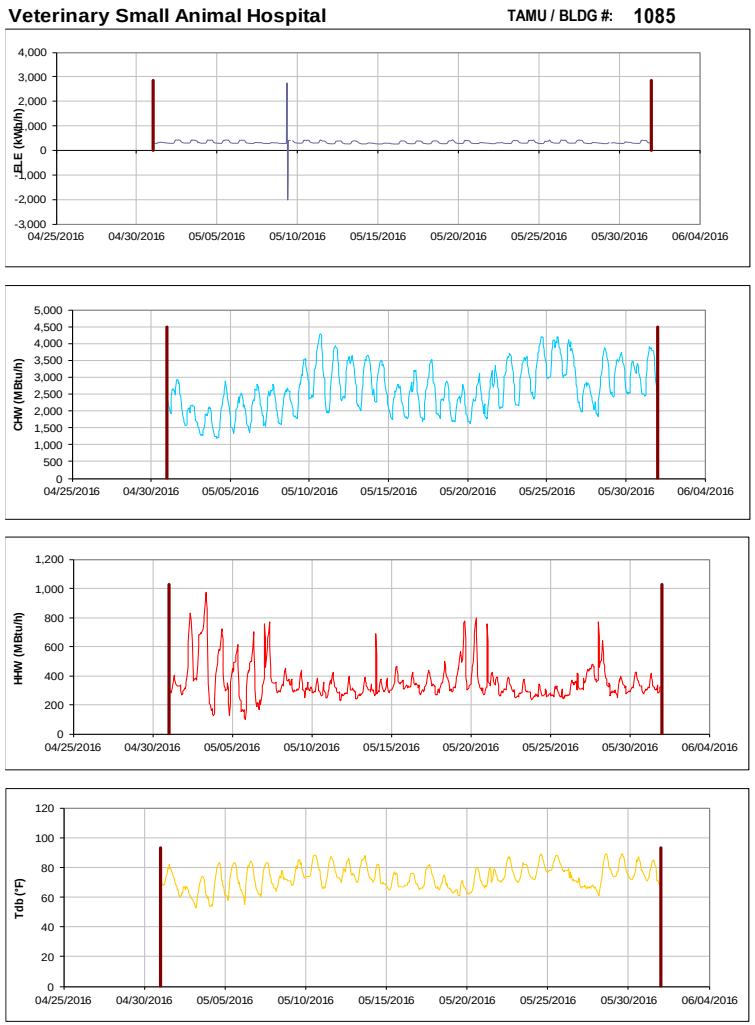


Figure III-128 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Veterinary Small Animal Hospital during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

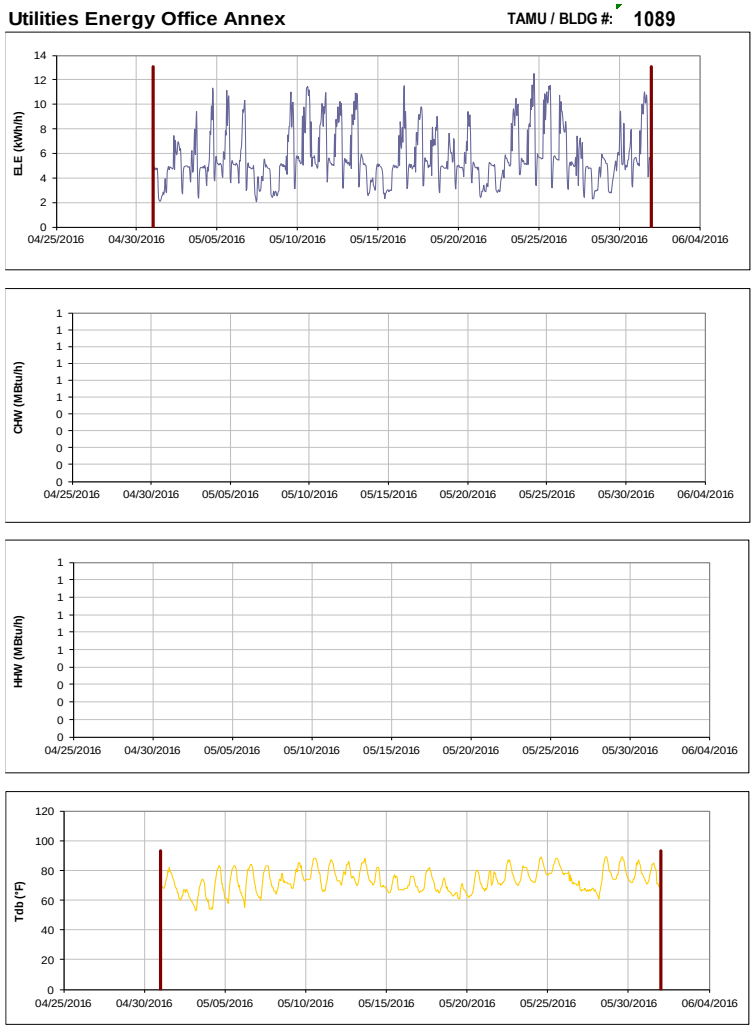


Figure III-129 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Utilities Energy Office Annex during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

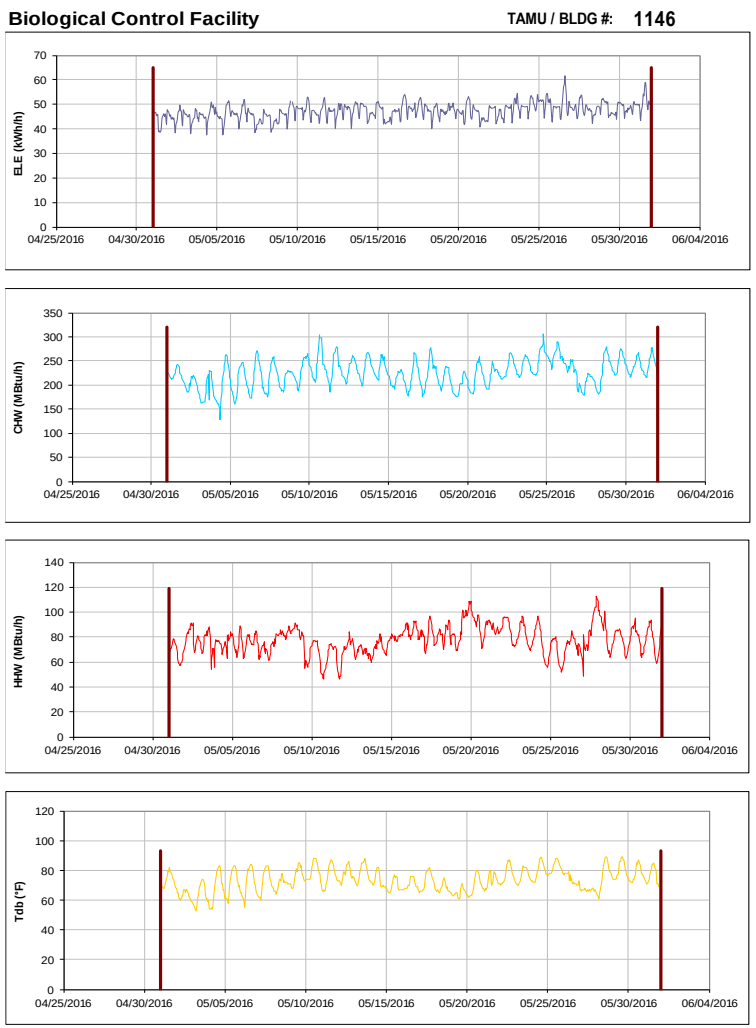


Figure III-130 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Biological Control Facility during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

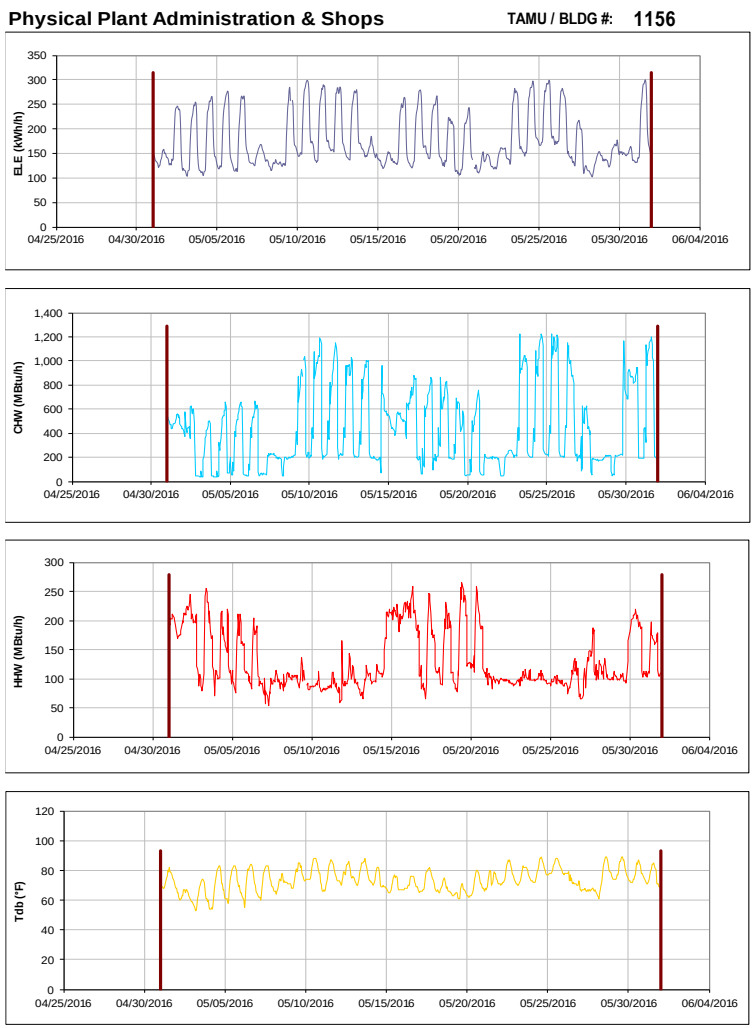


Figure III-131 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Physical Plant Administration & Shops during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-132 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Veterinary Anatomic Pathology during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-133 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Veterinary Large Animal Hospital during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

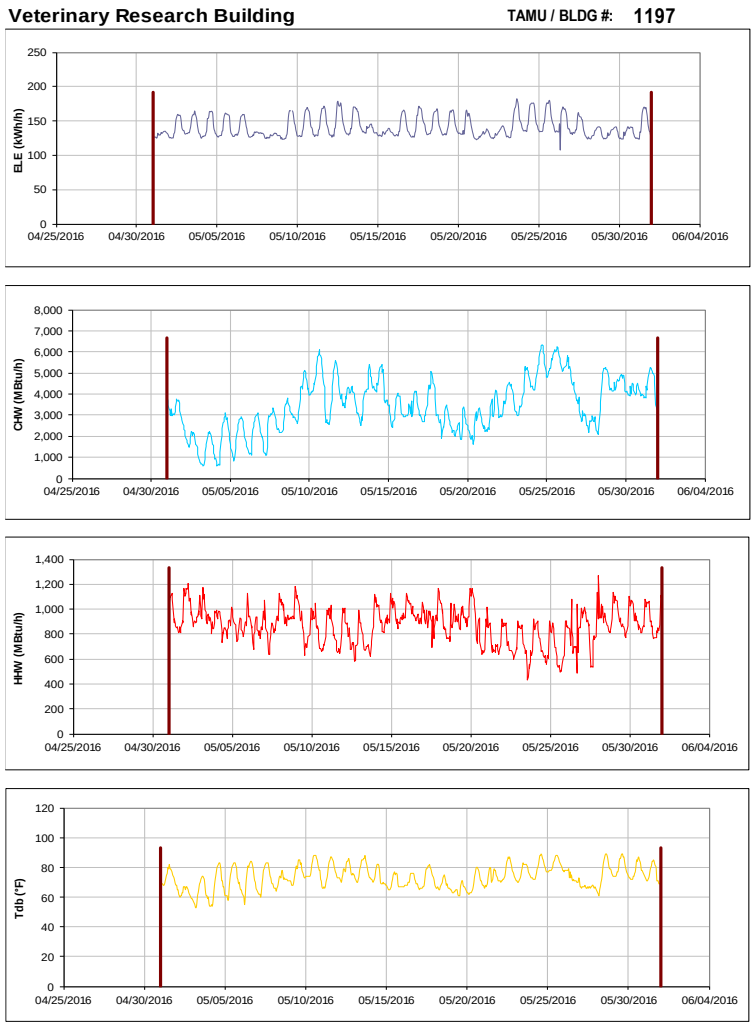


Figure III-134 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Veterinary Research Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

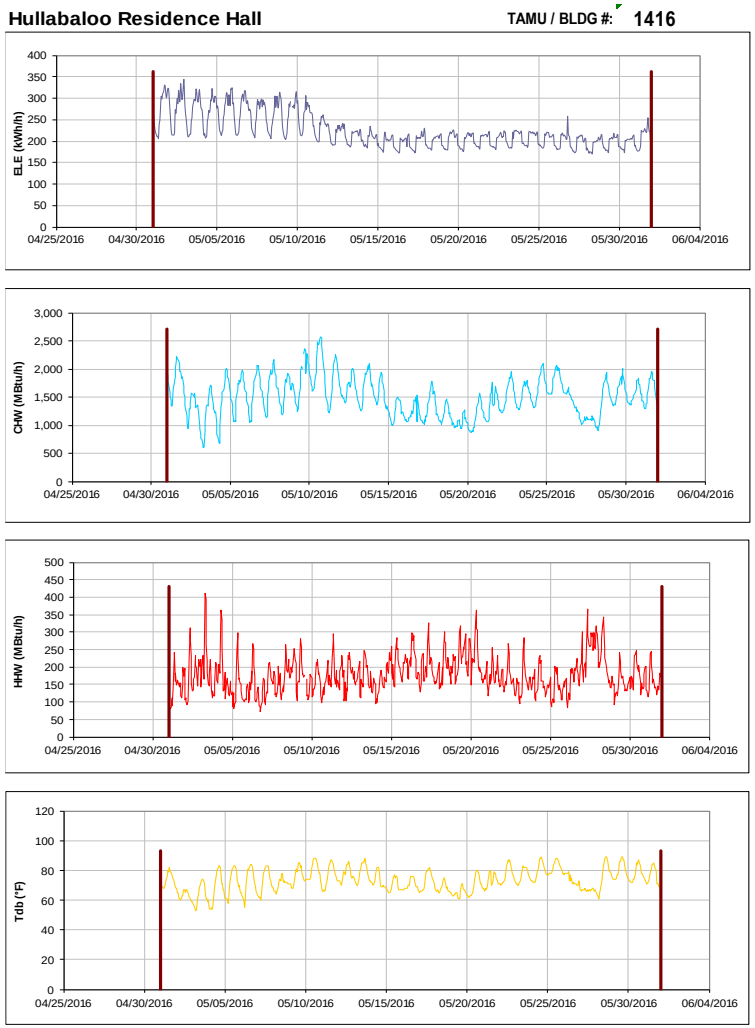


Figure III-135 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Hullabaloo Residence Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

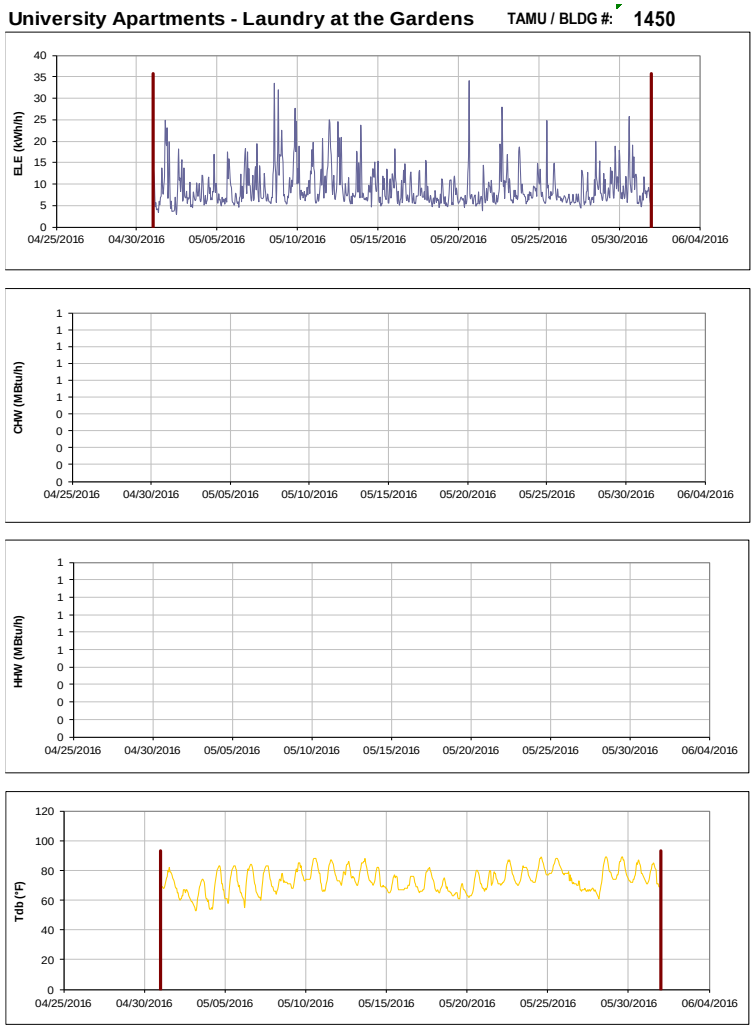


Figure III-136 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for University Apartments - Laundry at the Gardens during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

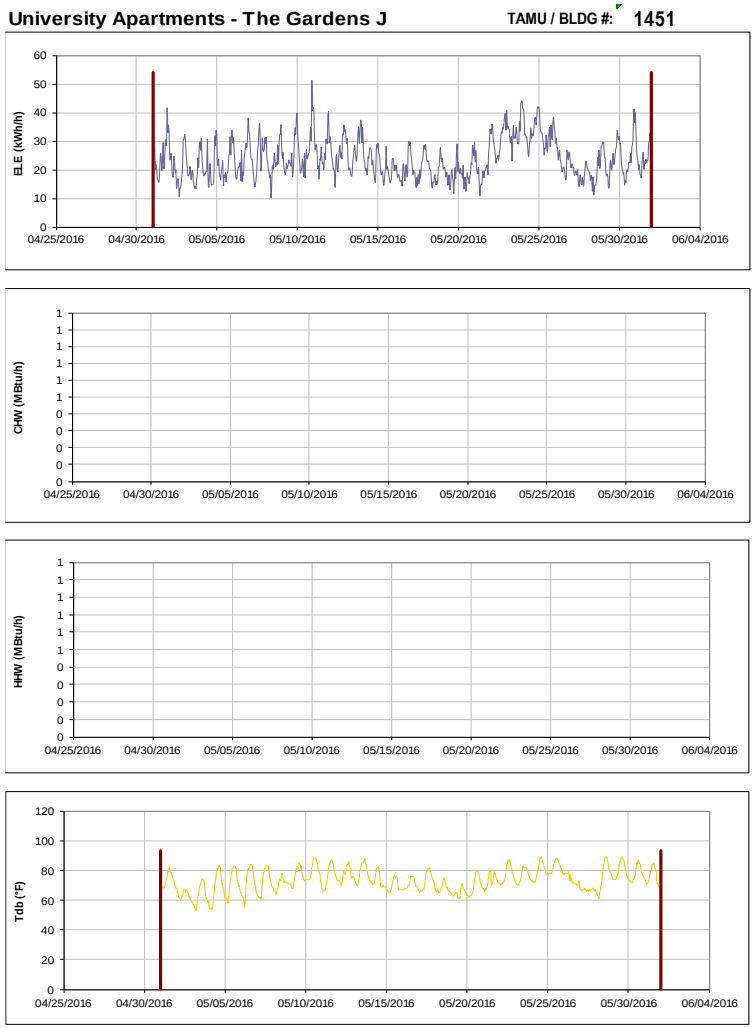


Figure III-137 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for University Apartments - The Gardens J during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

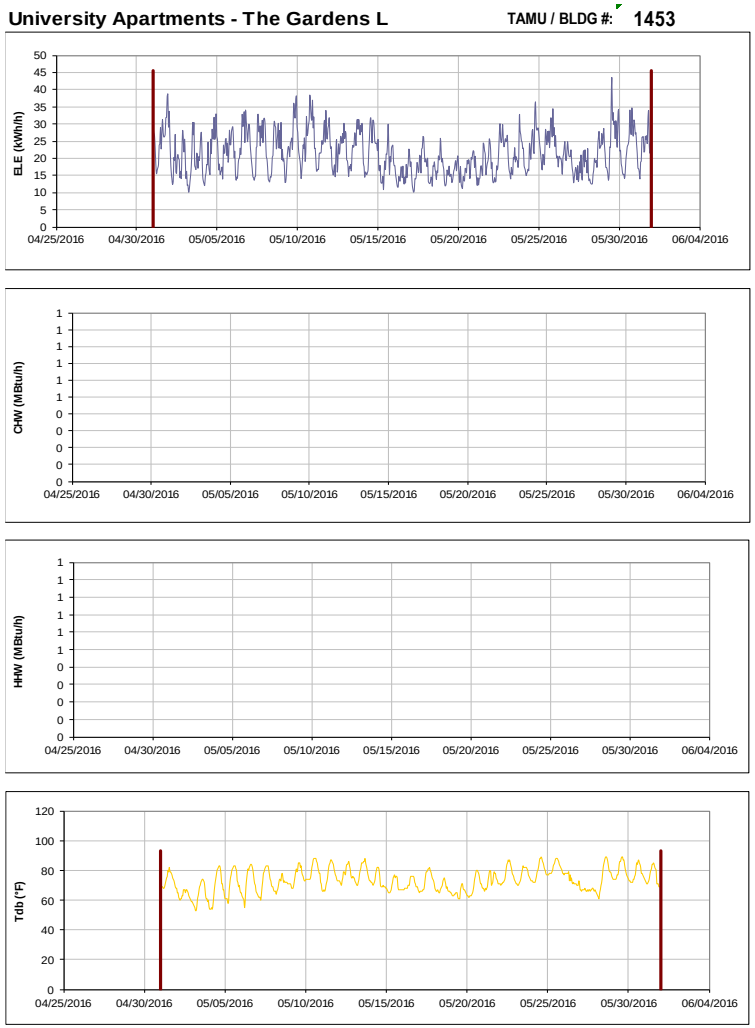


Figure III-138 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for University Apartments - The Gardens L during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

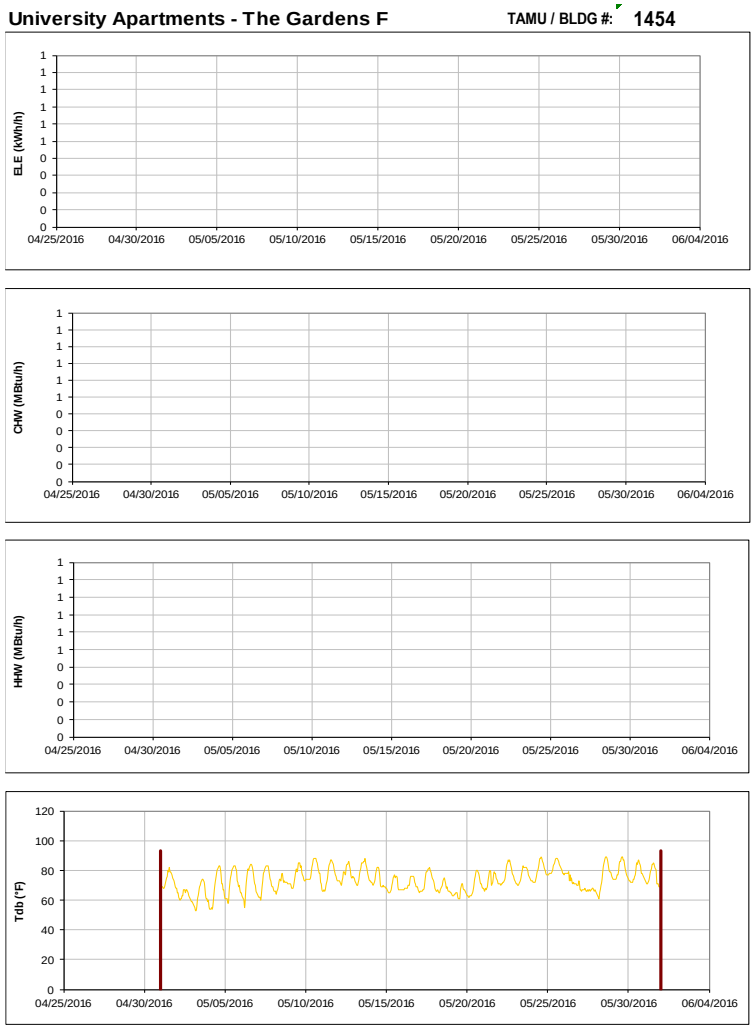


Figure III-139 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for University Apartments - The Gardens F during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

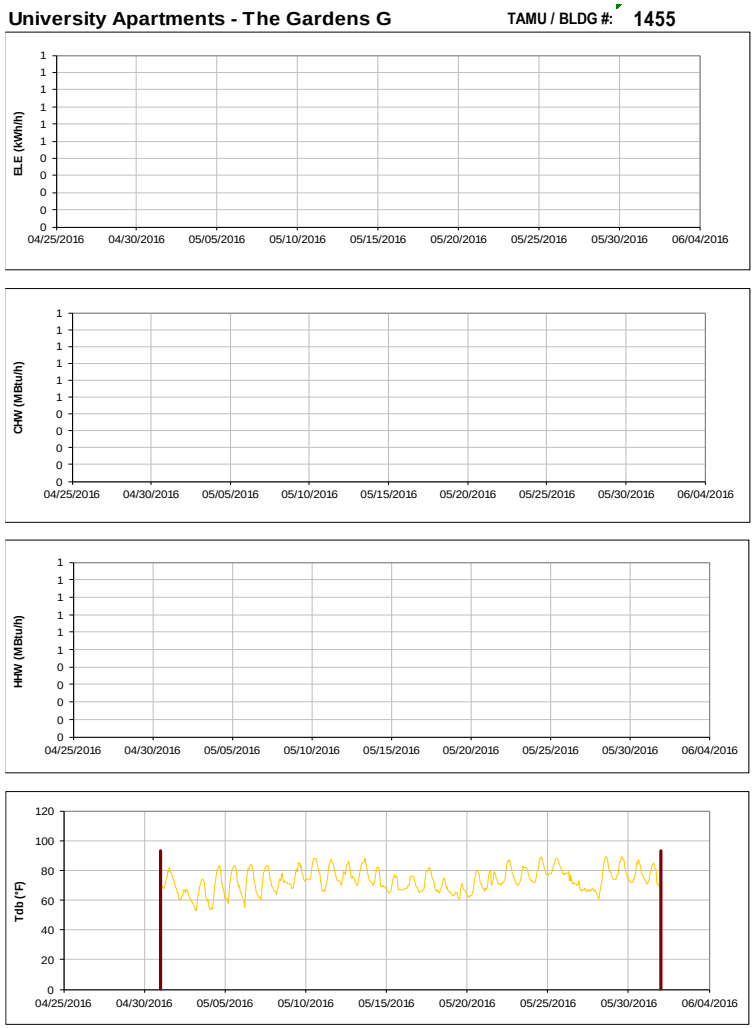


Figure III-140 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for University Apartments - The Gardens G during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

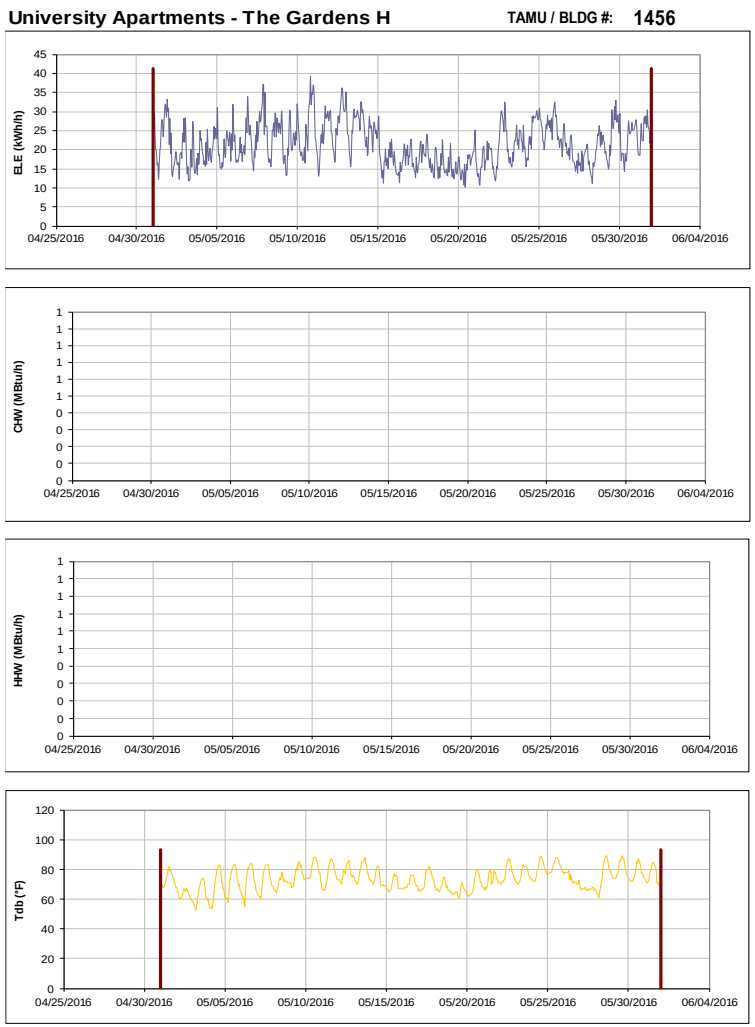


Figure III-141 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for University Apartments - The Gardens H during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

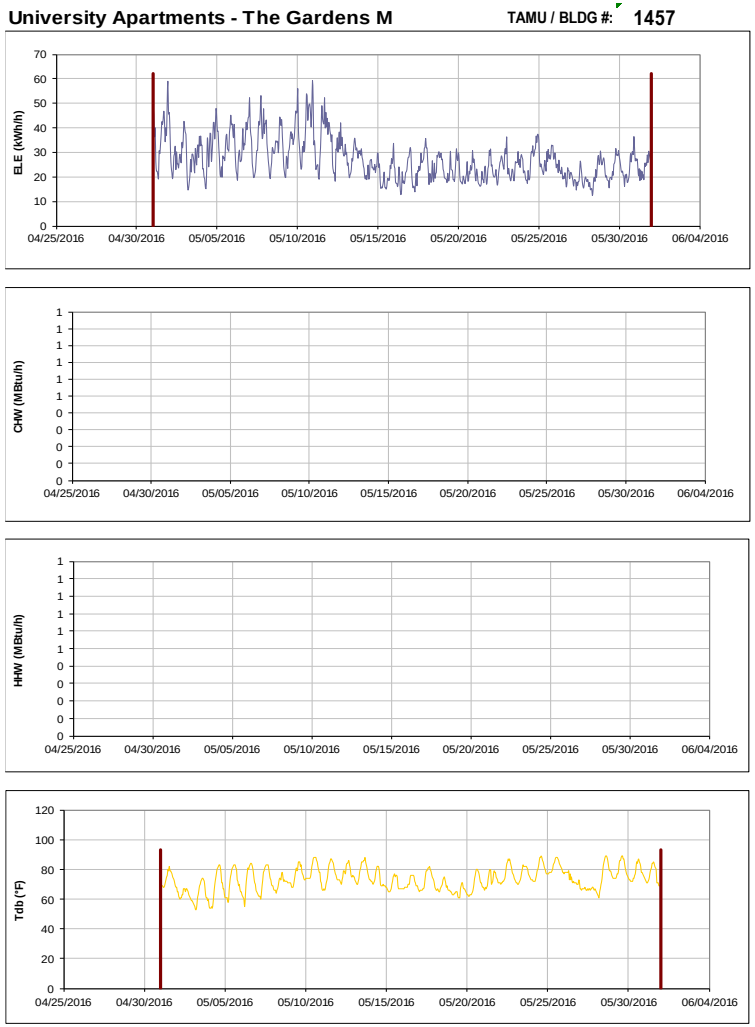


Figure III-142 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for University Apartments - The Gardens M during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

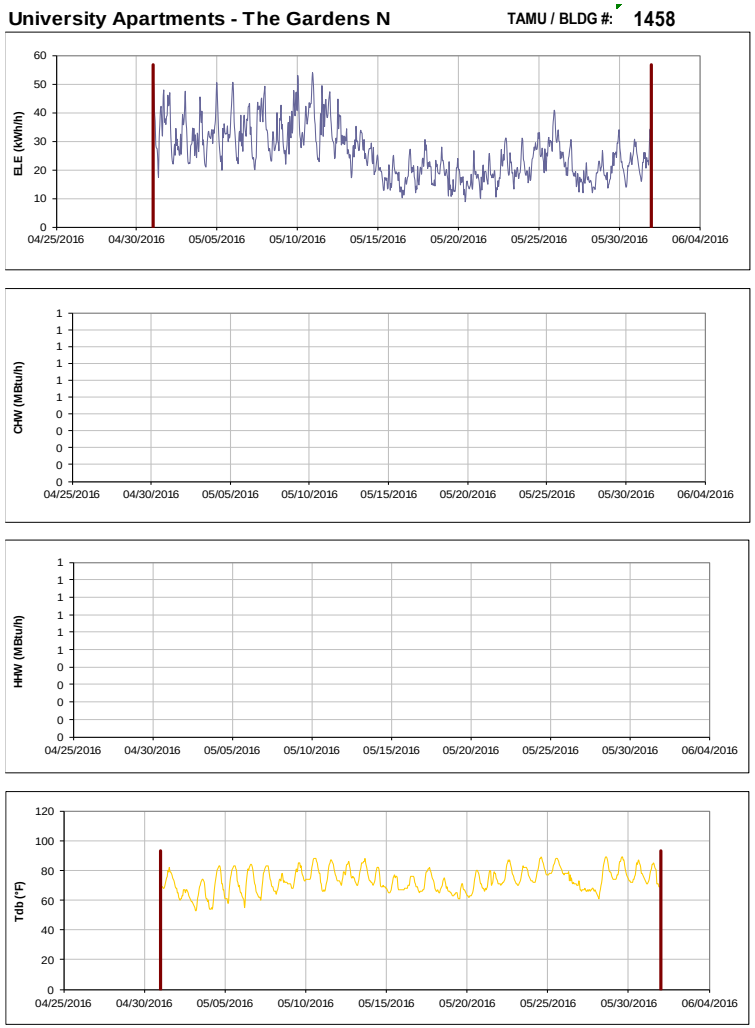


Figure III-143 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for University Apartments - The Gardens N during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

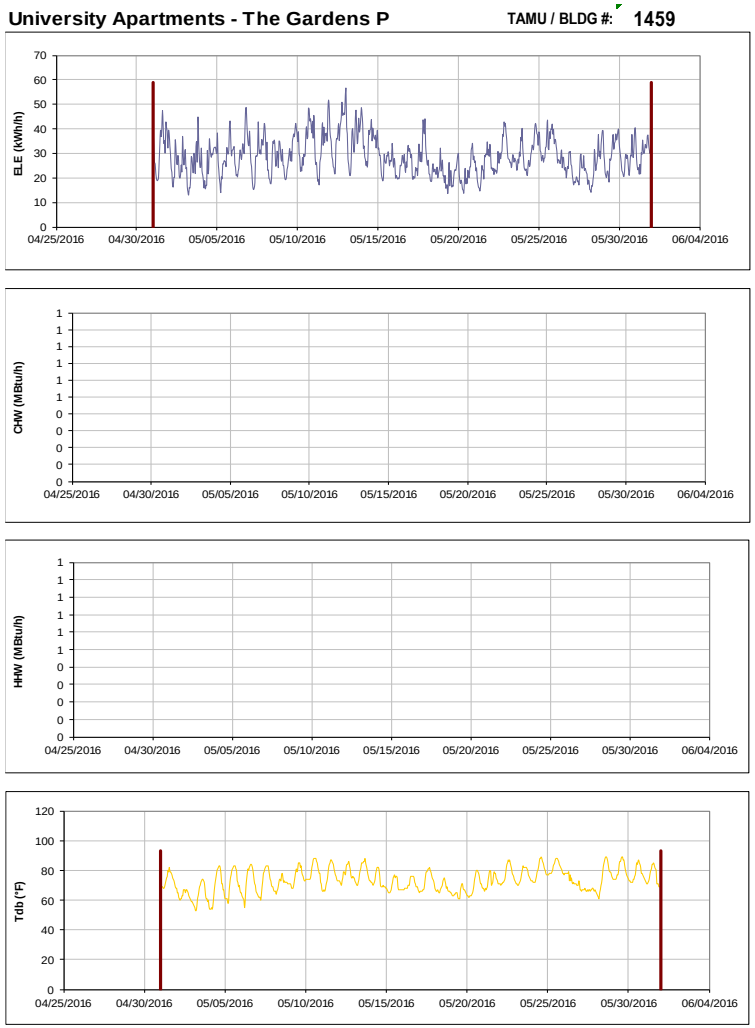


Figure III-144 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for University Apartments - The Gardens P during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

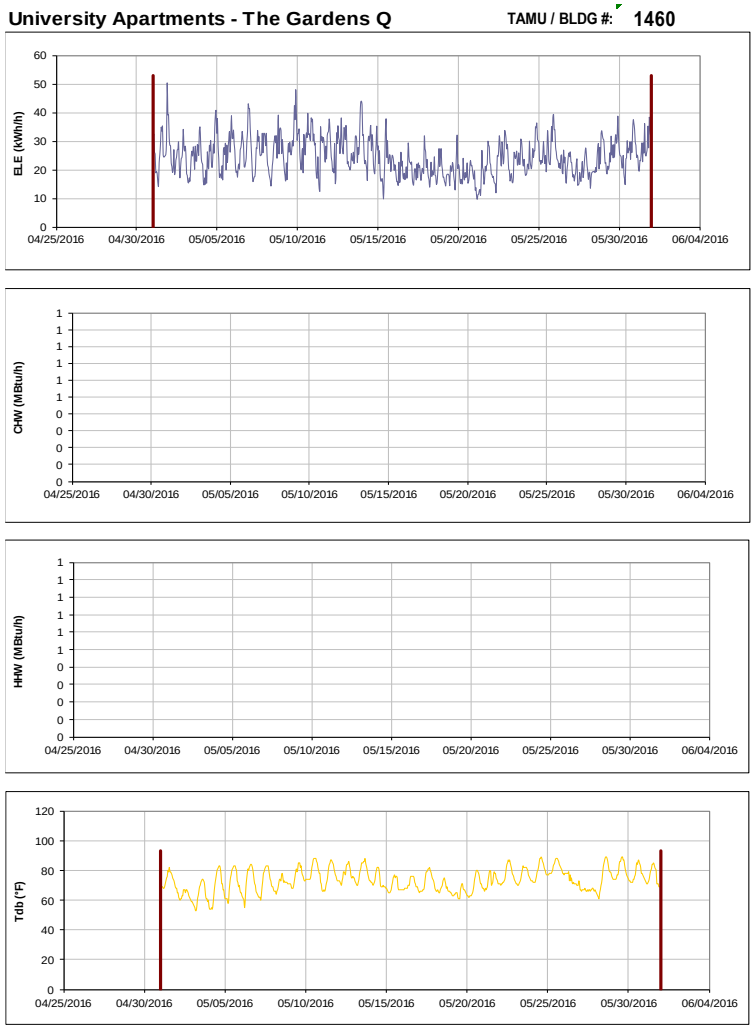


Figure III-145 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for University Apartments - The Gardens Q during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

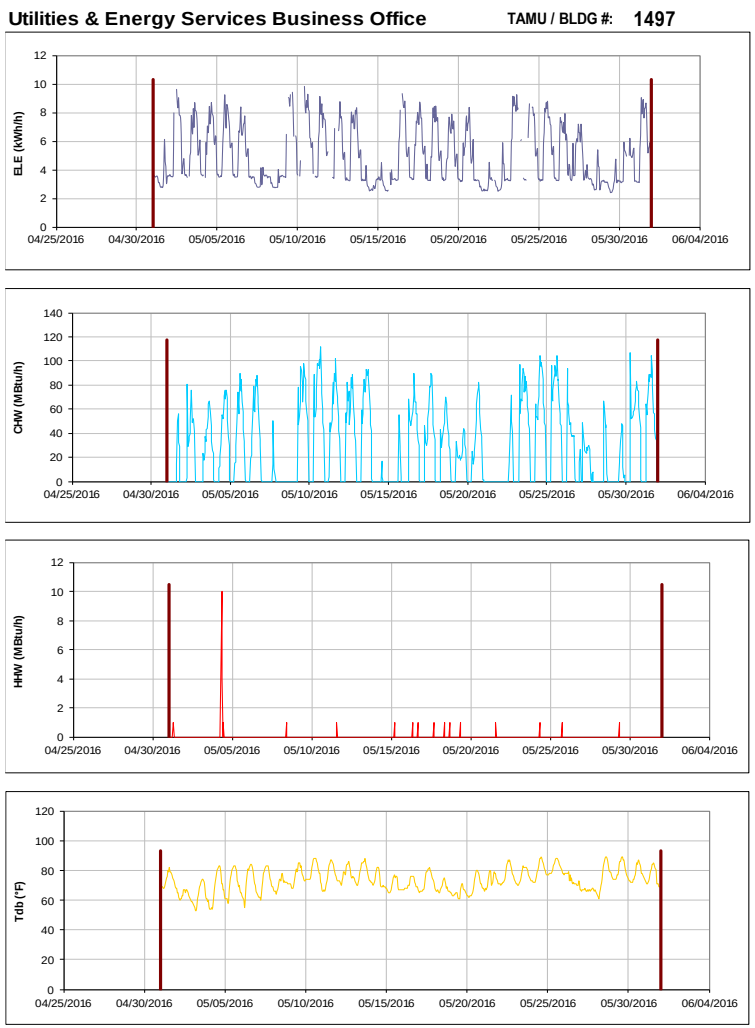


Figure III-146 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Utilities & Energy Services Business Office during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-147 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Kleberg Center during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

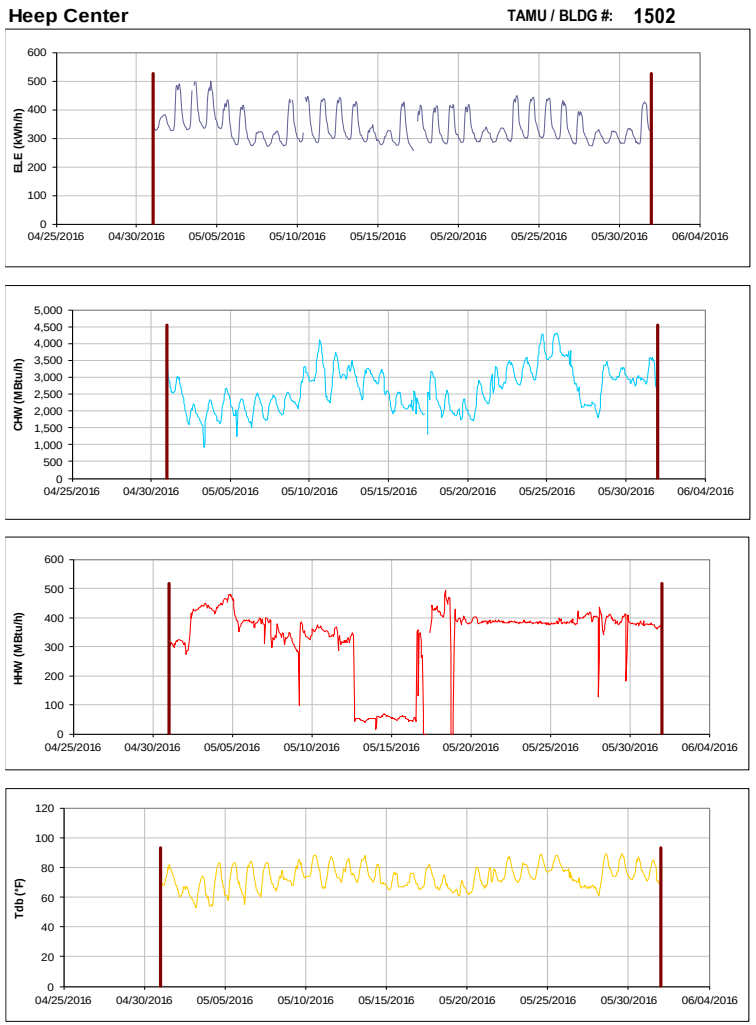


Figure III-148 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Heep Center during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

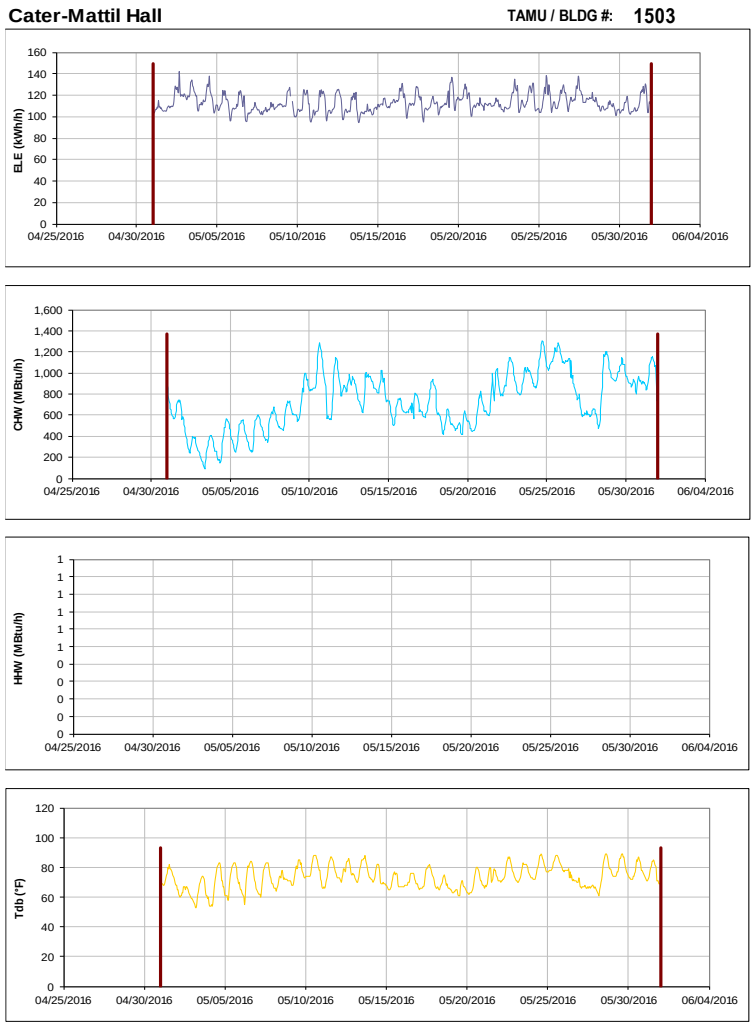


Figure III-149 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Cater-Mattil Hall during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

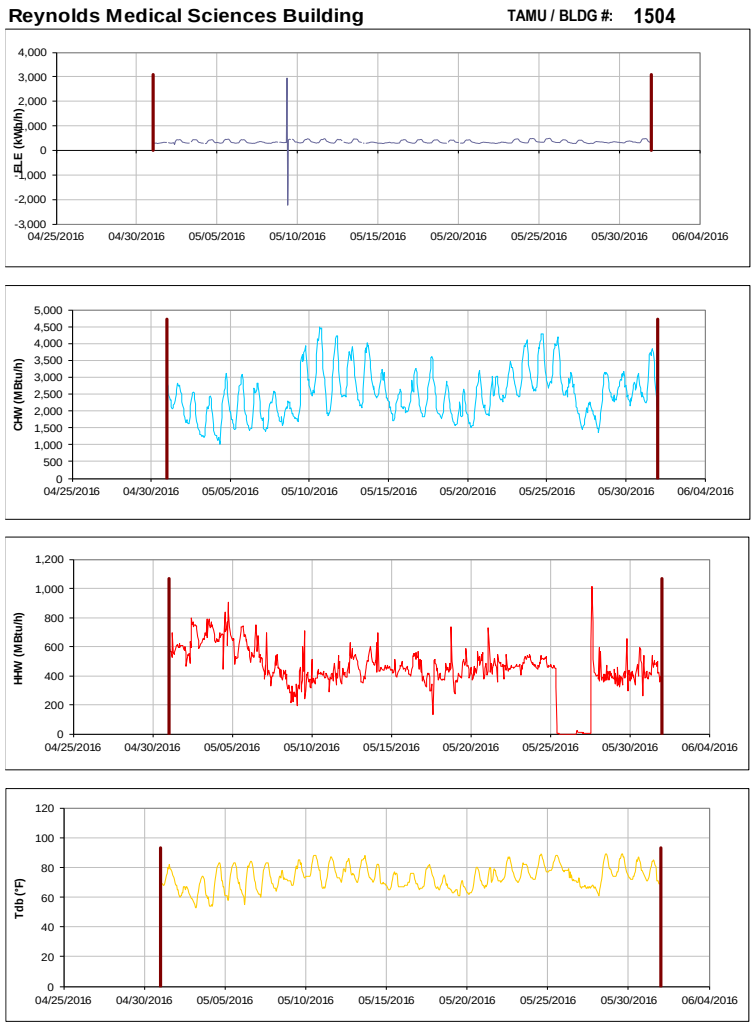


Figure III-150 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Reynolds Medical Sciences Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-151 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Rosenthal Meat Science & Technology Center during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

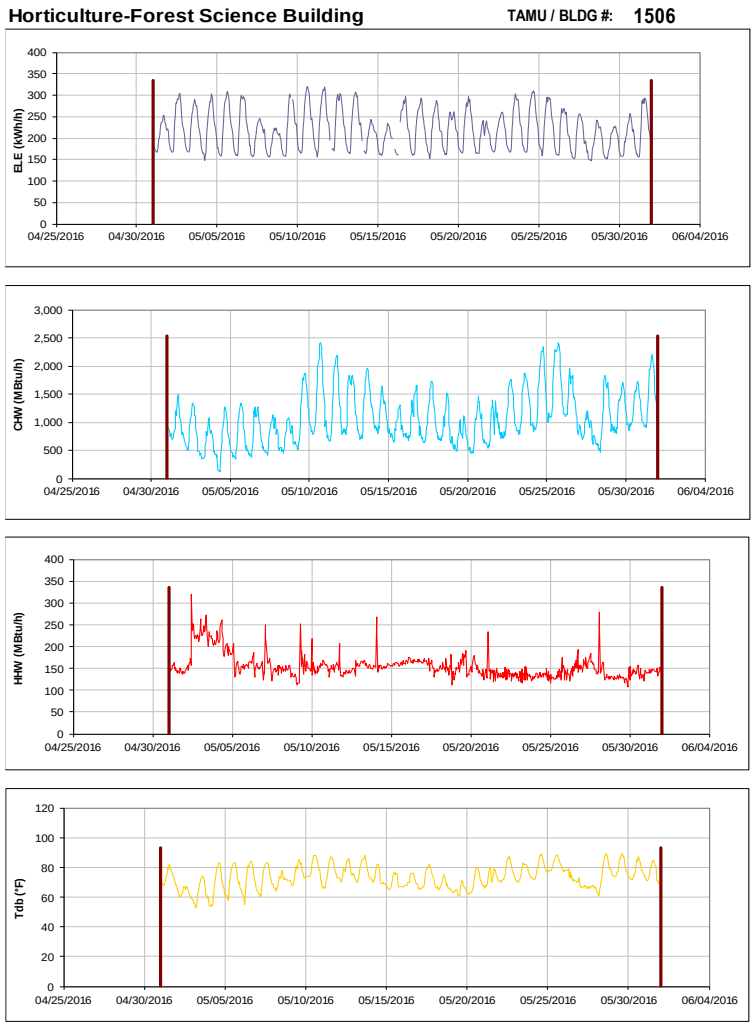


Figure III-152 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Horticulture-Forest Science Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-153 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Biochemistry-Biophysics Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

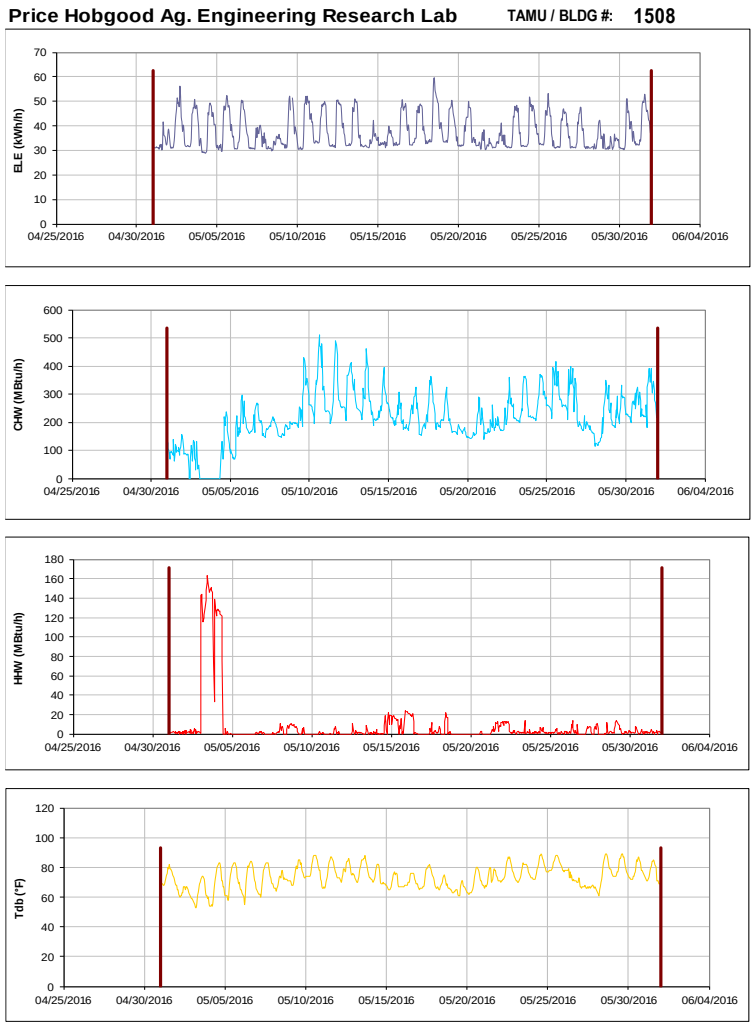


Figure III-154 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Price Hobgood Ag. Engineering Research Lab during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

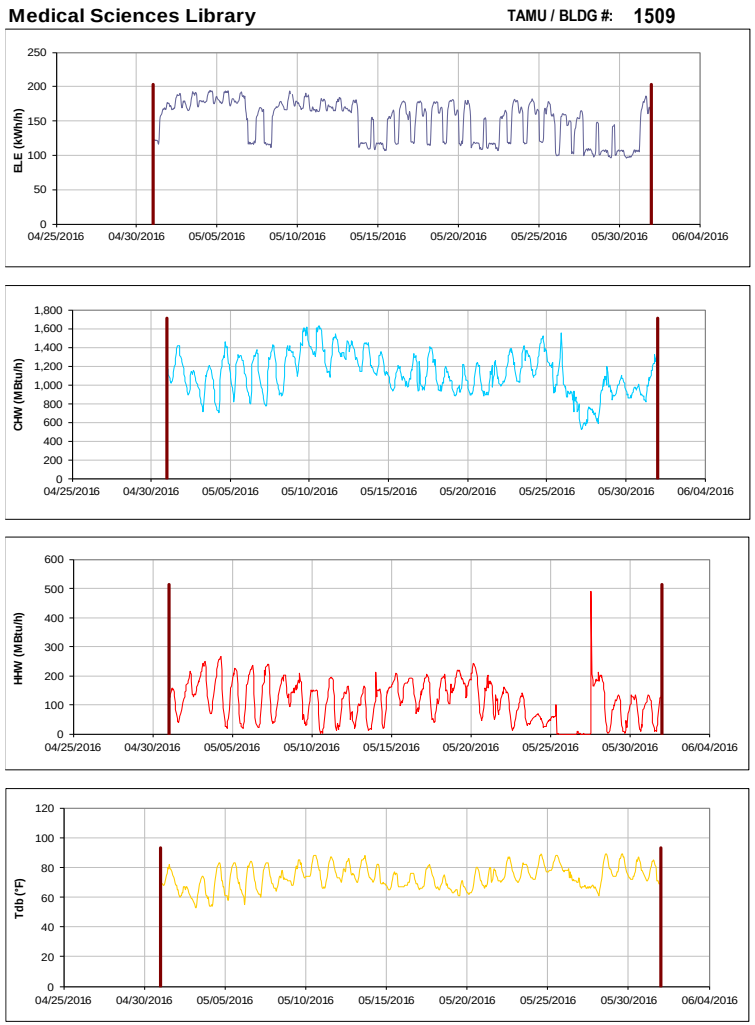


Figure III-155 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Medical Sciences Library during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-156 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Wehner Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-157 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for West Campus Library Facility during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

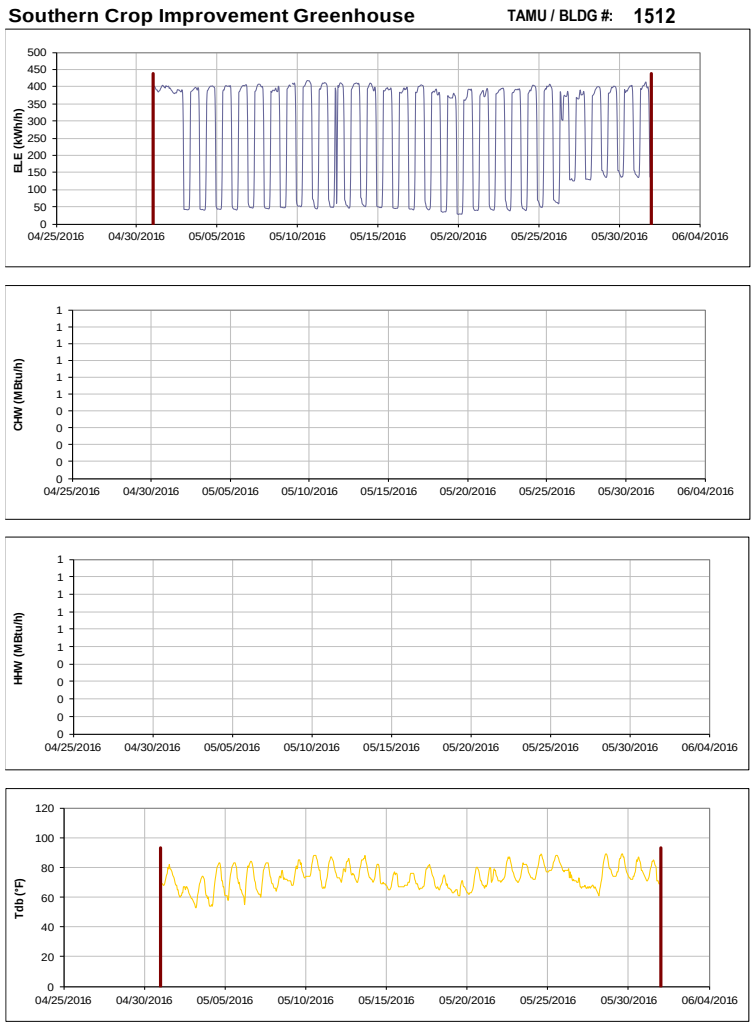


Figure III-158 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Southern Crop Improvement Greenhouse during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-159 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Borlaug Center for Southern Crop Improvement during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

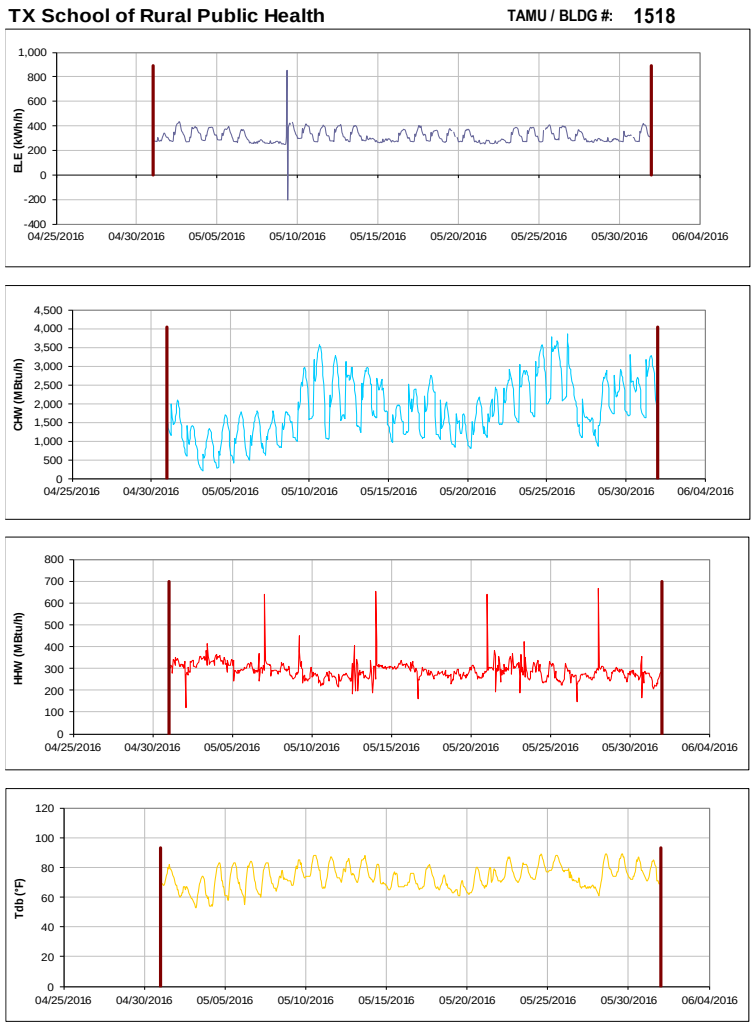


Figure III-160 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for TX School of Rural Public Health during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-161 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Nuclear Magnetic Resonance Facility during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-162 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Interdisciplinary Life Sciences Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

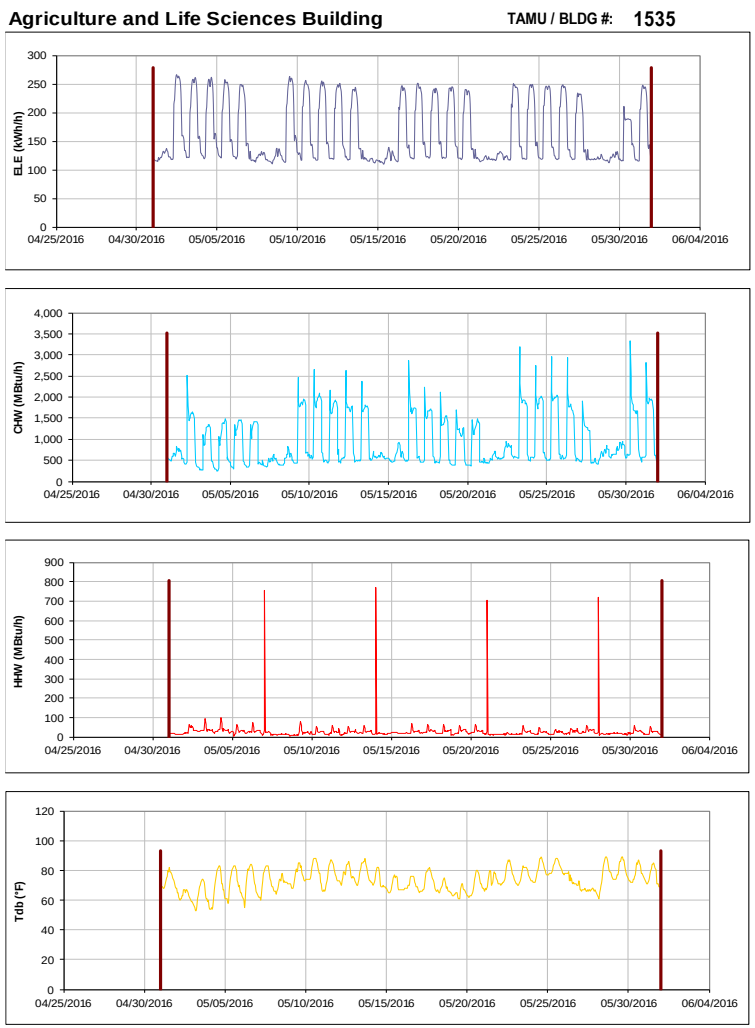


Figure III-163 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Agriculture and Life Sciences Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-164 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for AgriLife Services Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-165 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Agriculture Program Visitors Center during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

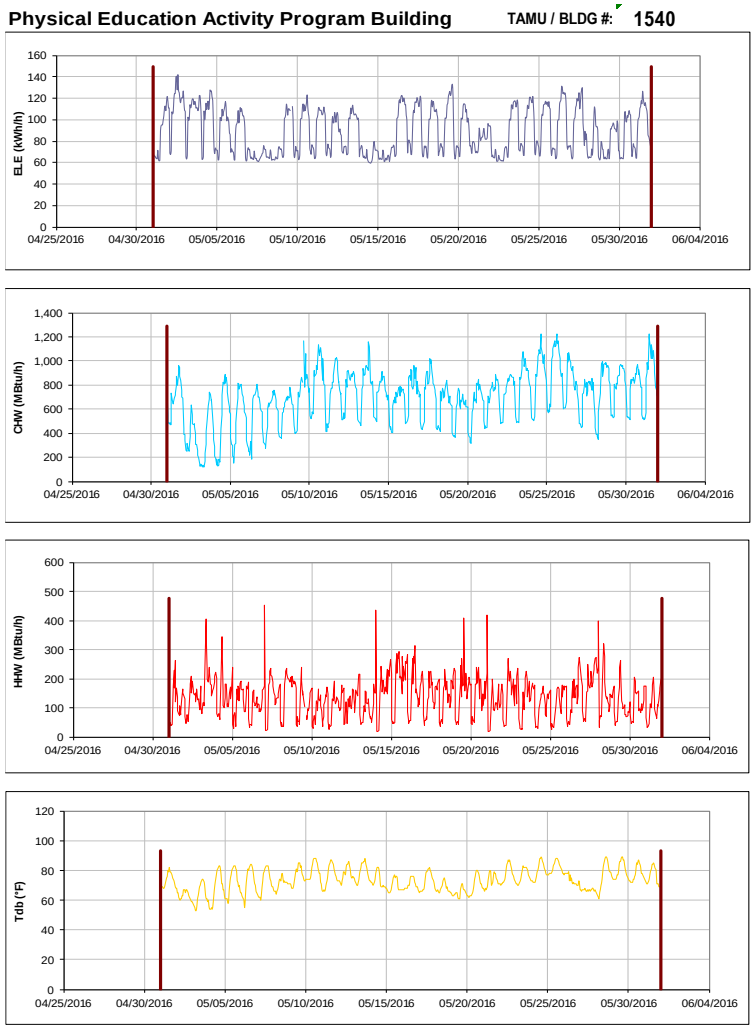


Figure III-166 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Physical Education Activity Program Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

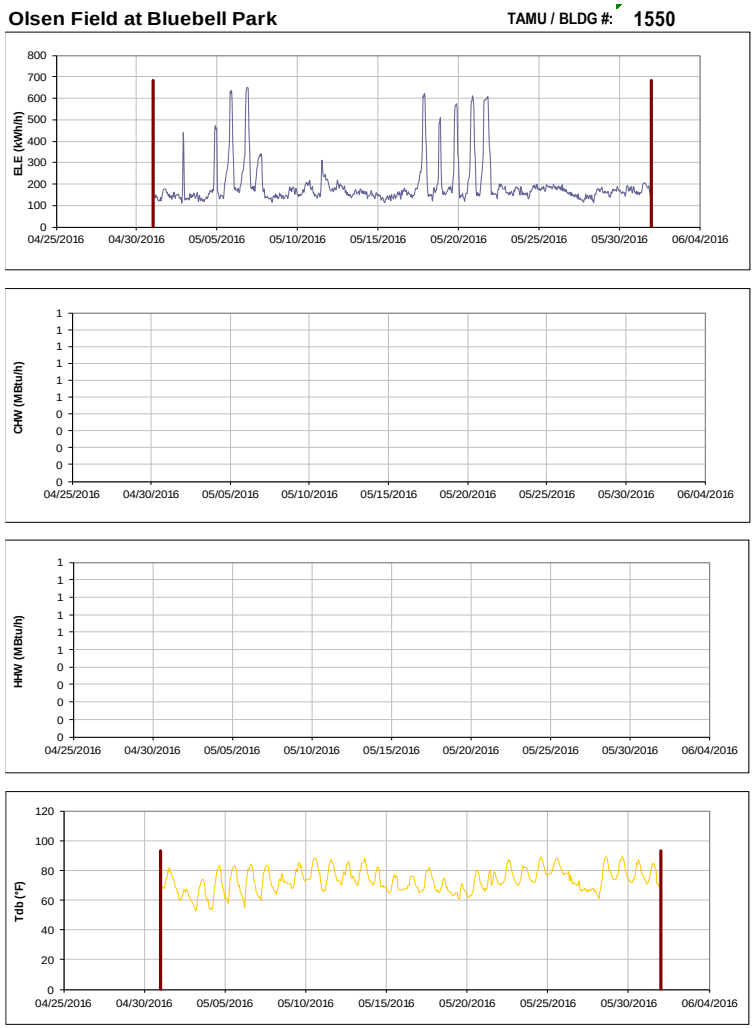


Figure III-167 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Olsen Field at Bluebell Park during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

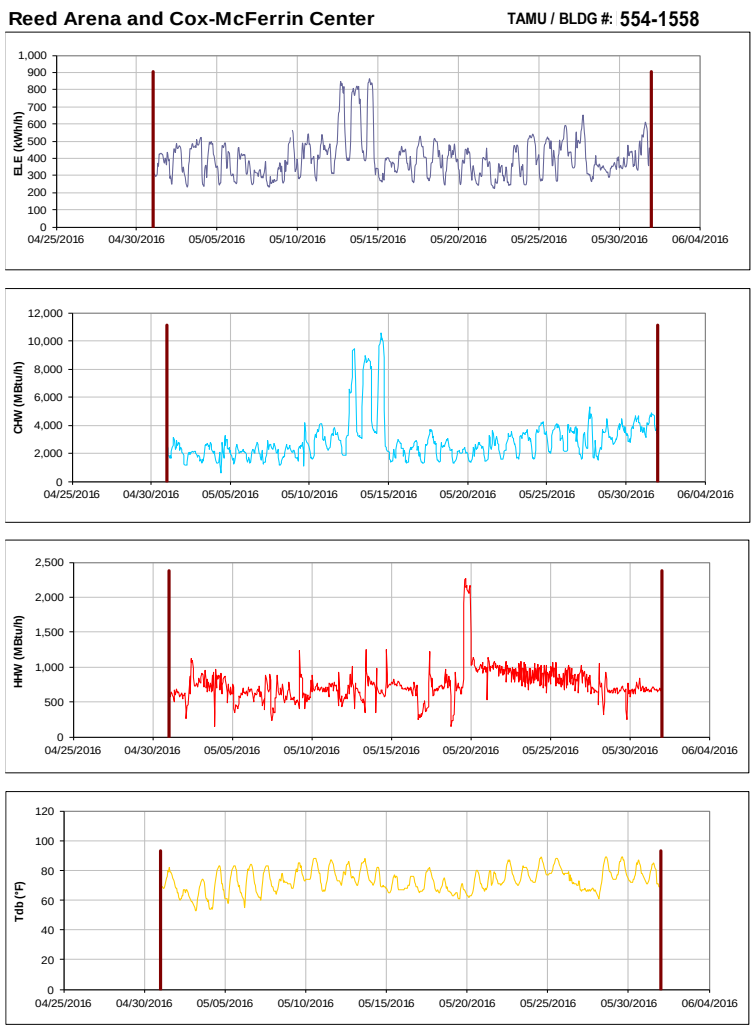


Figure III-168 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Reed Arena and Cox-McFerrin Center during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

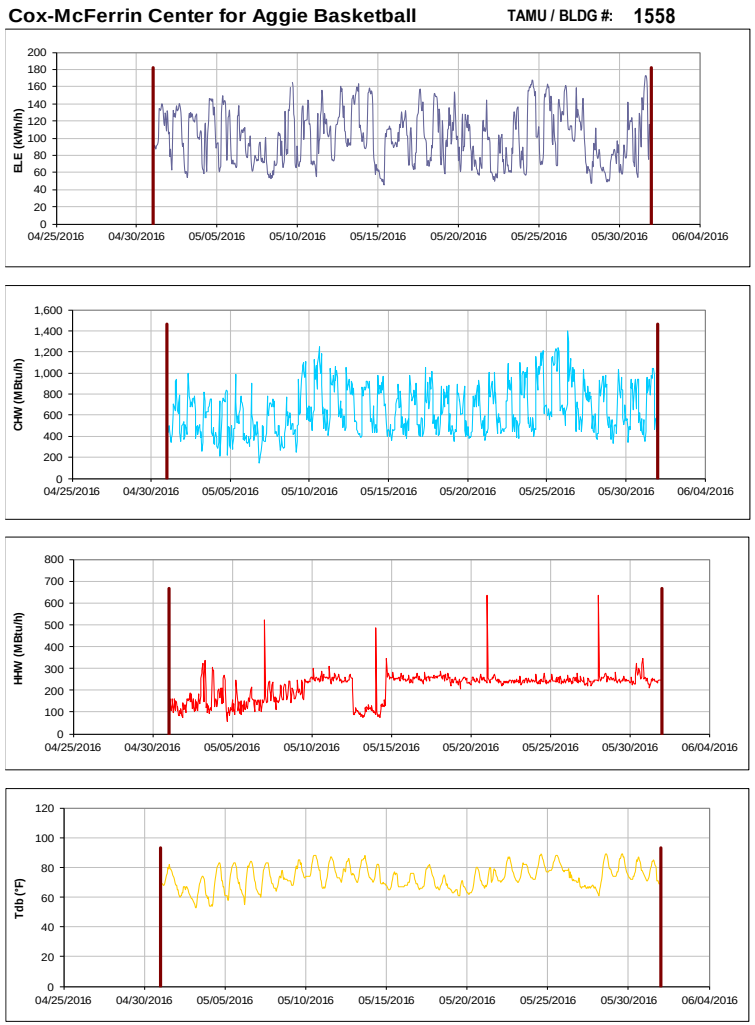


Figure III-169 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Cox-McFerrin Center for Aggie Basketball during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-170 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for West Campus Parking Garage during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-171 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Student Recreation Center during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

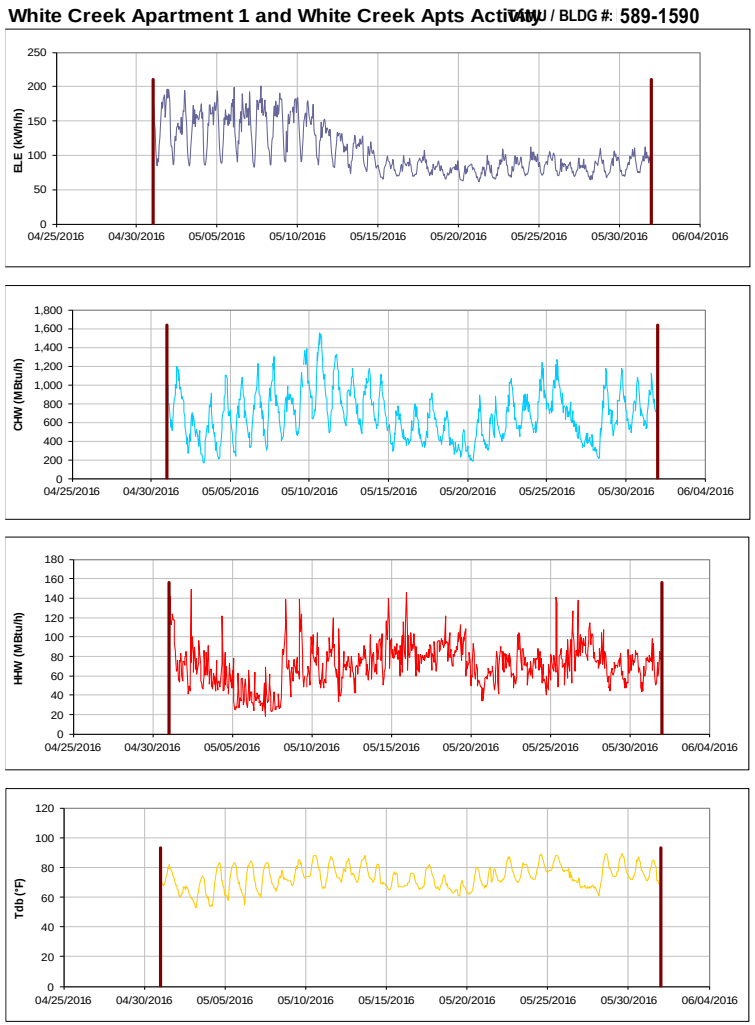


Figure III-172 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for White Creek Apartment 1 and White Creek Apts Activity Center during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

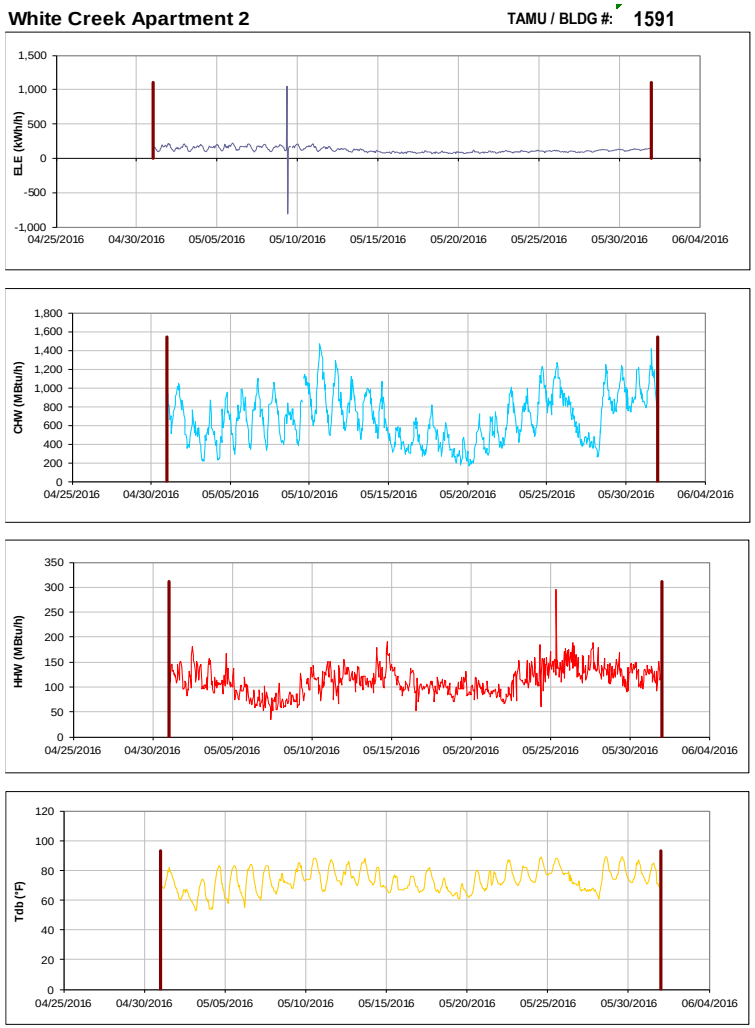


Figure III-173 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for White Creek Apartment 2 during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

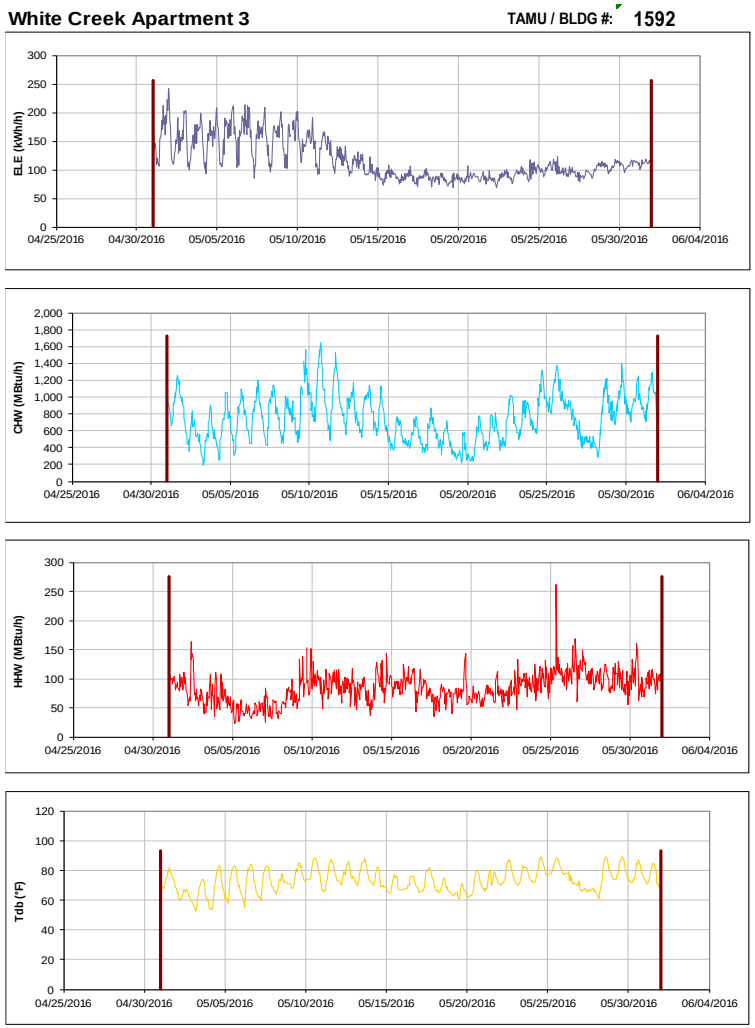


Figure III-174 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for White Creek Apartment 3 during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

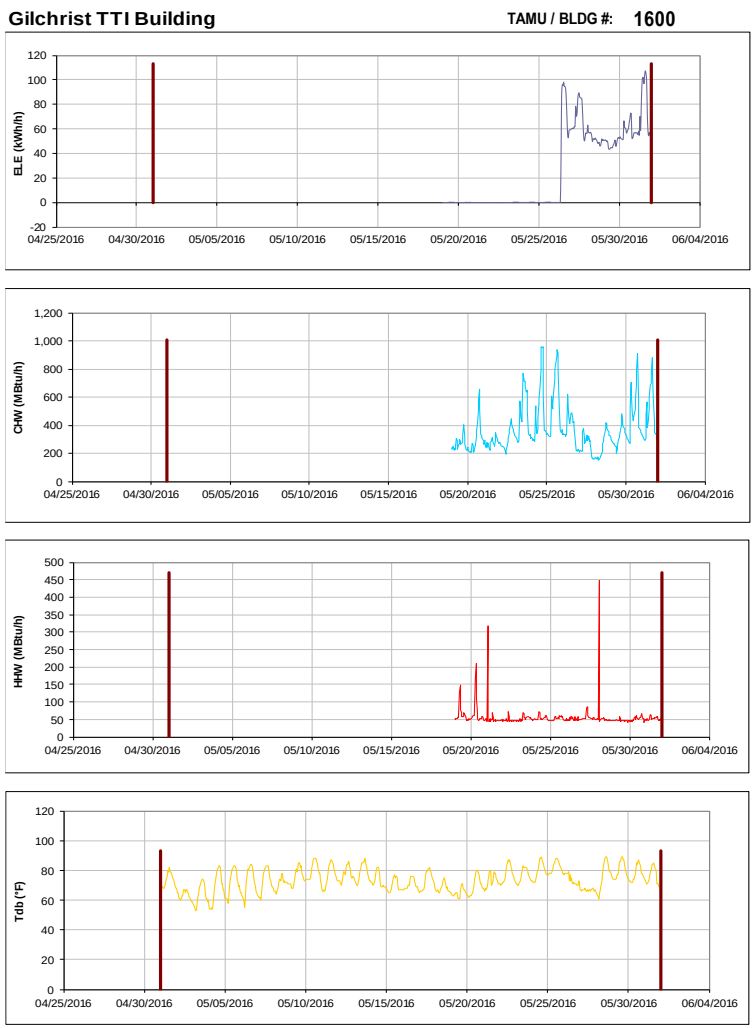


Figure III-175 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Gilchrist TTI Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

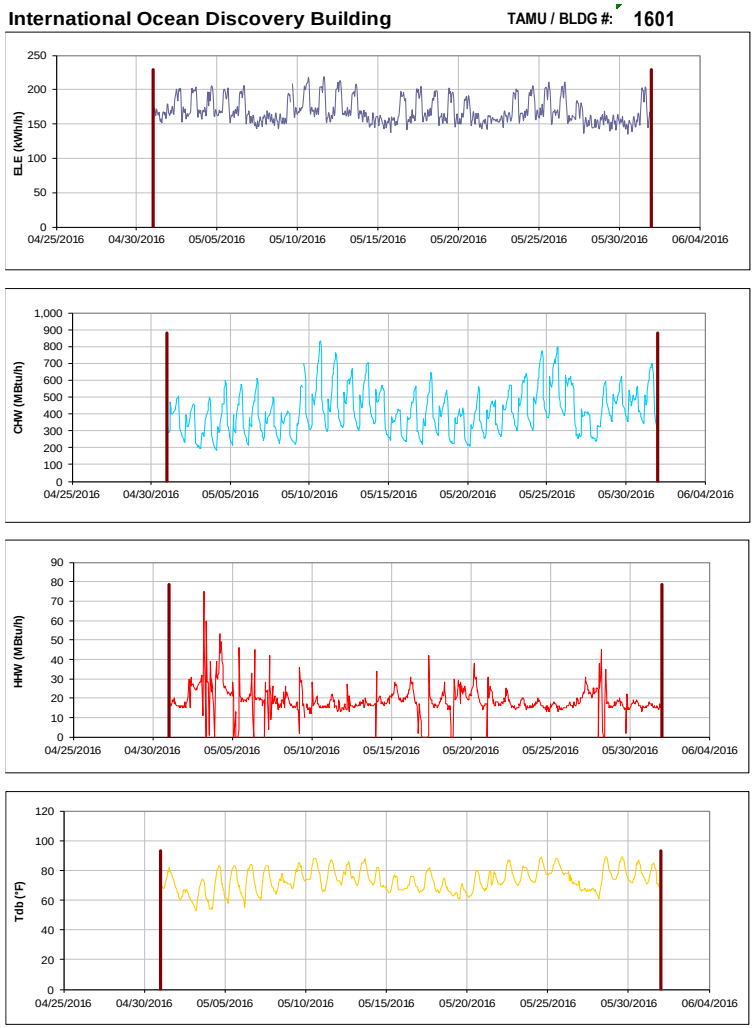


Figure III-176 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for International Ocean Discovery Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

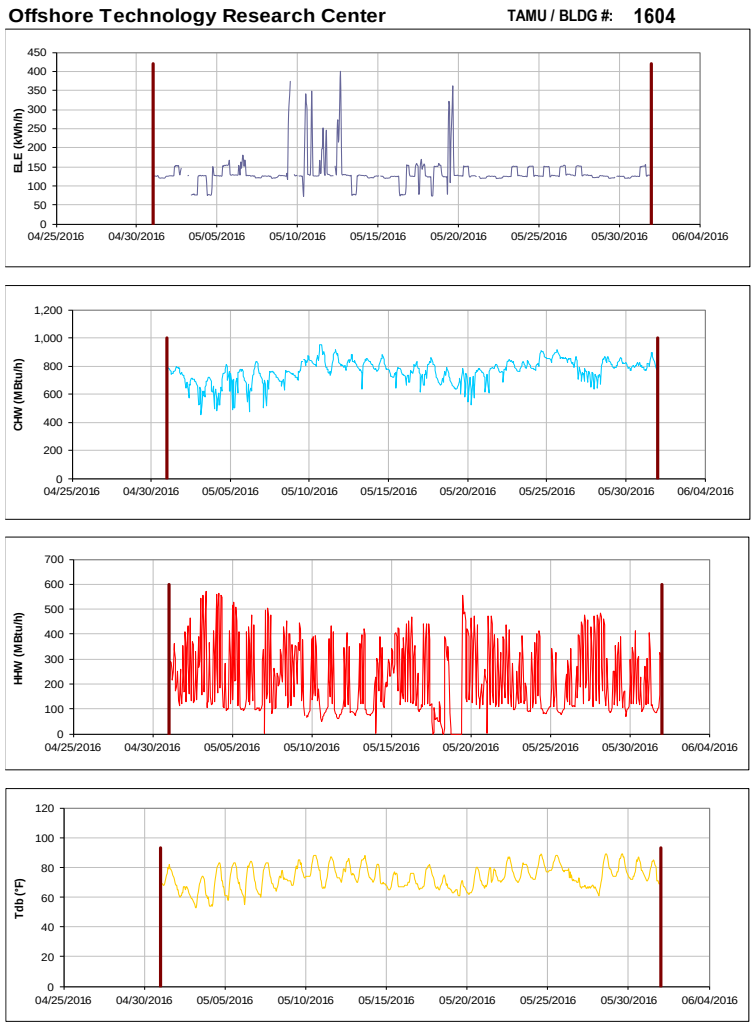


Figure III-177 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Offshore Technology Research Center during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

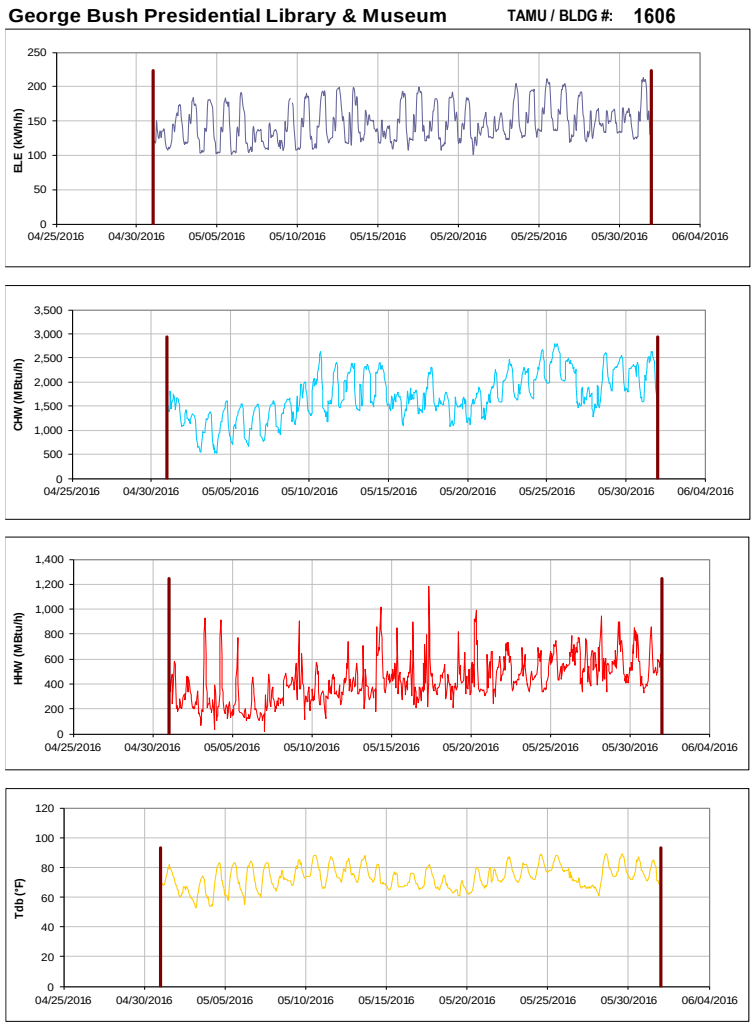


Figure III-178 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for George Bush Presidential Library & Museum during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

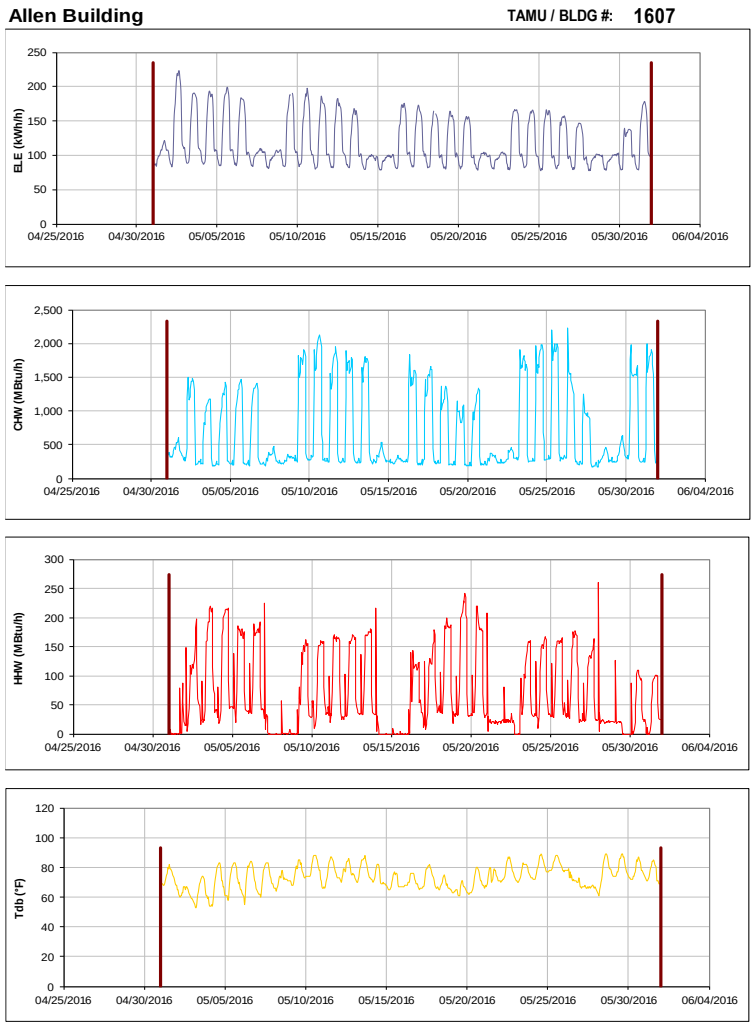


Figure III-179 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Allen Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

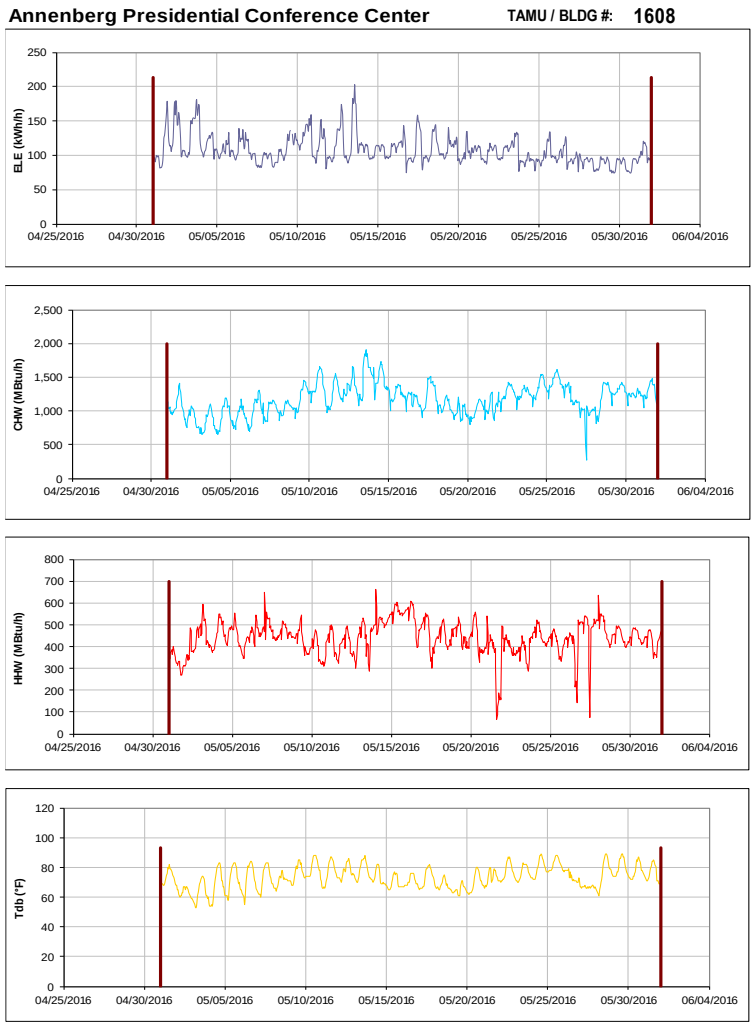


Figure III-180 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Annenberg Presidential Conference Center during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-181 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for TTI Headquarters during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

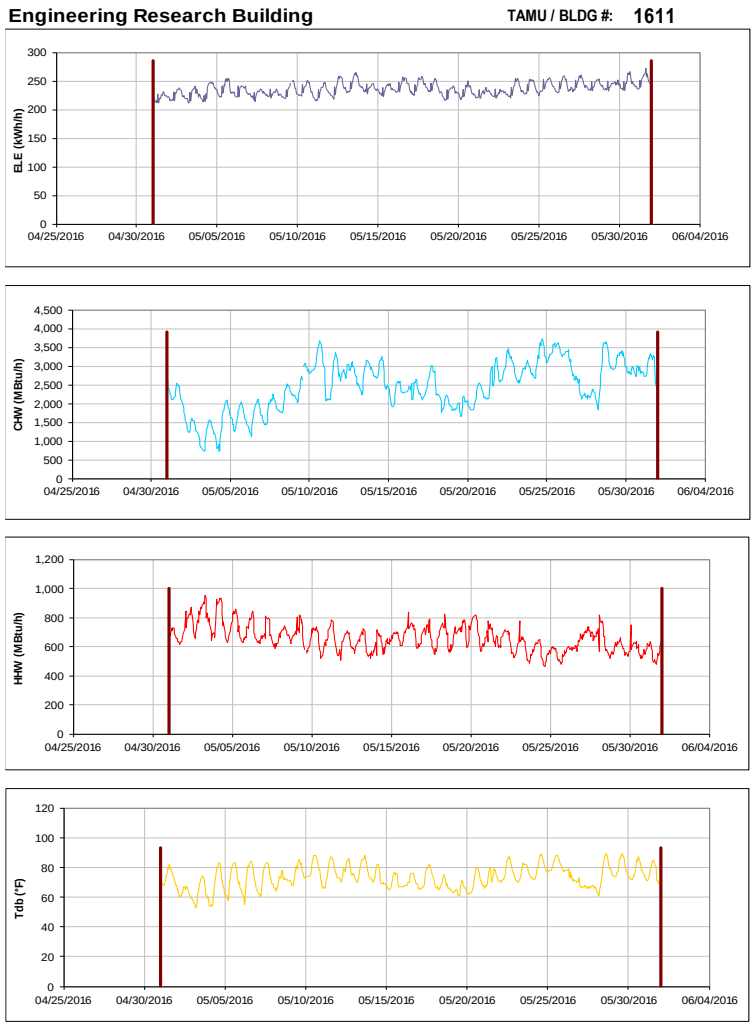


Figure III-182 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Engineering Research Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-183 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for General Services Complex during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

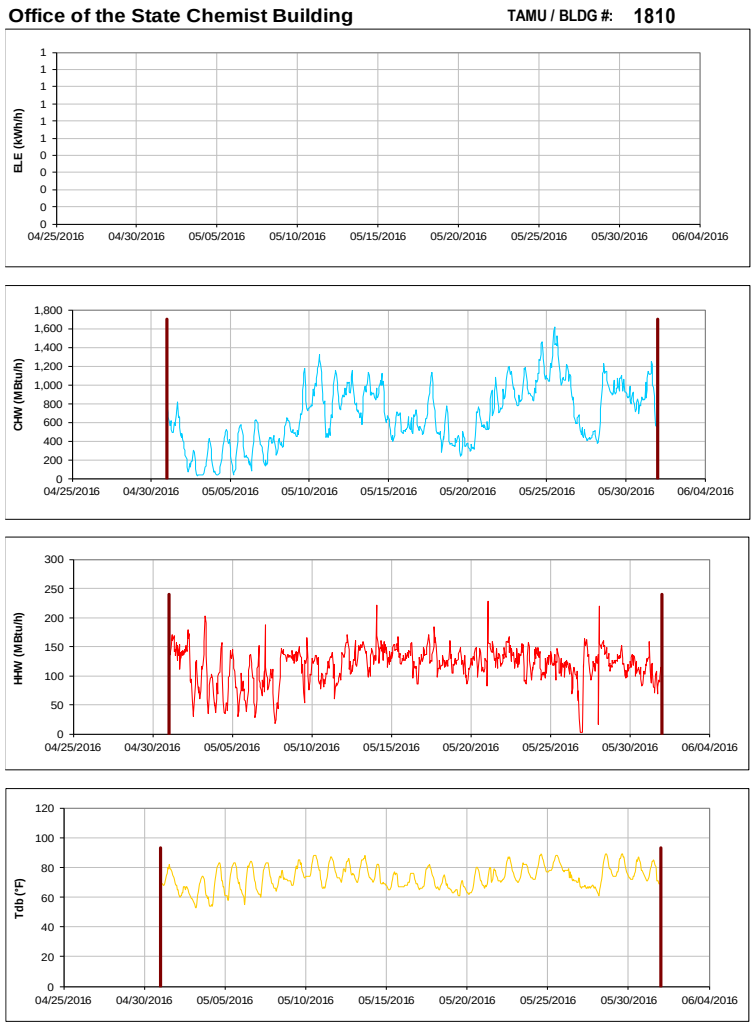


Figure III-184 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Office of the State Chemist Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

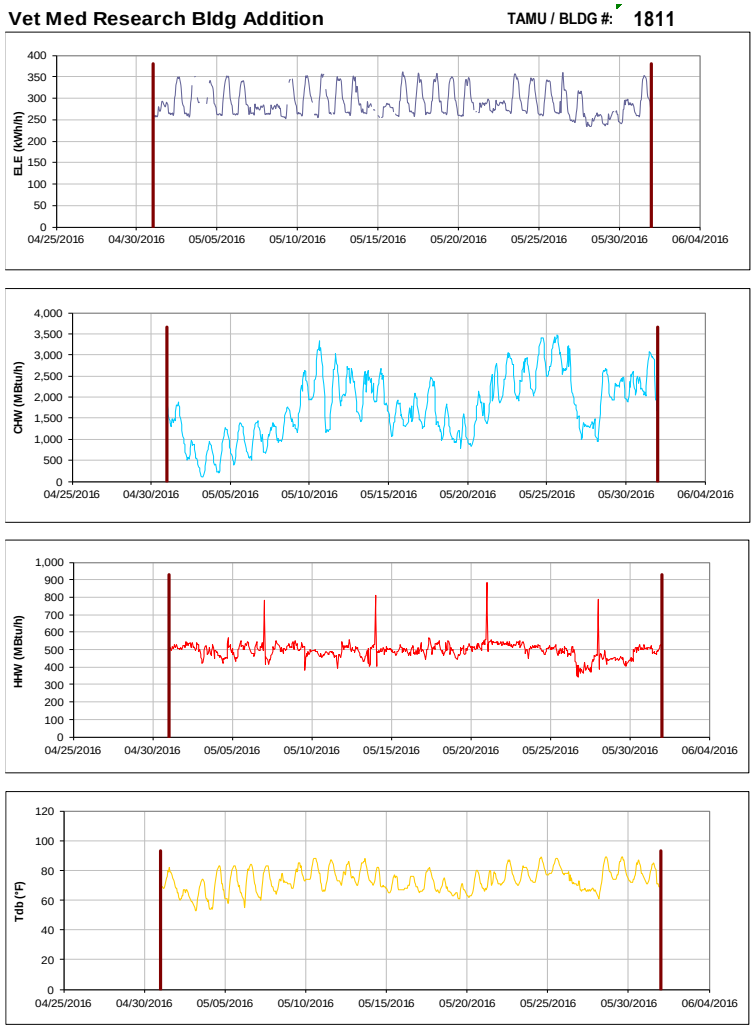


Figure III-185 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Vet Med Research Bldg Addition during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

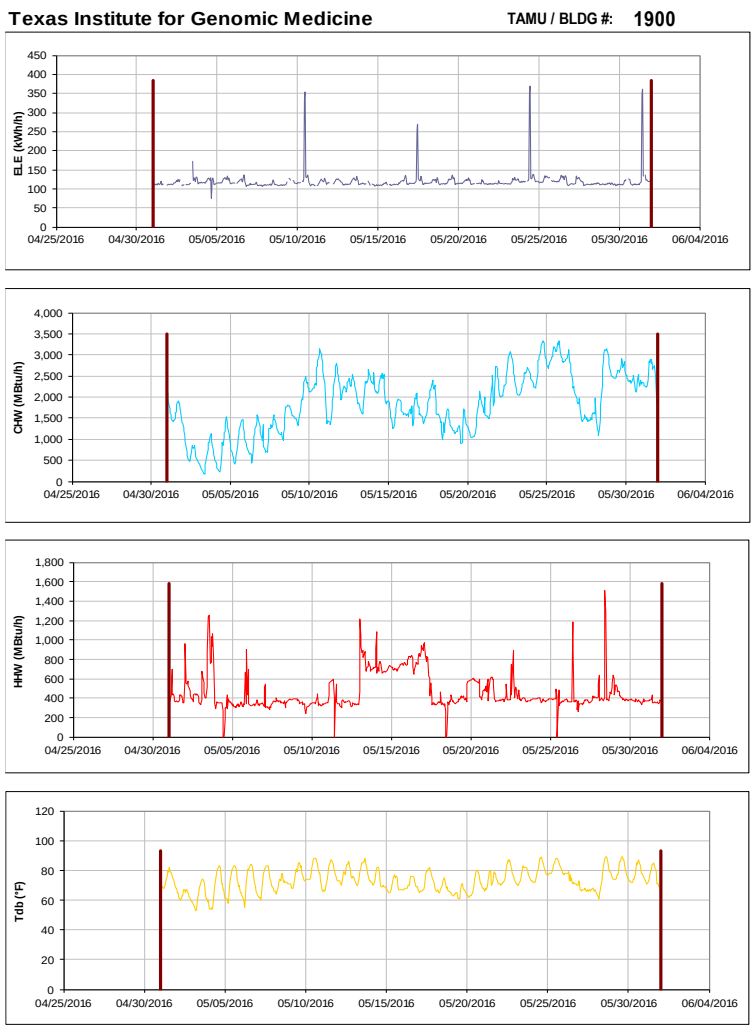


Figure III-186 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Texas Institute for Genomic Medicine during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

Figure III-187 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Texas A&M Institute for Preclinical Studies A during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

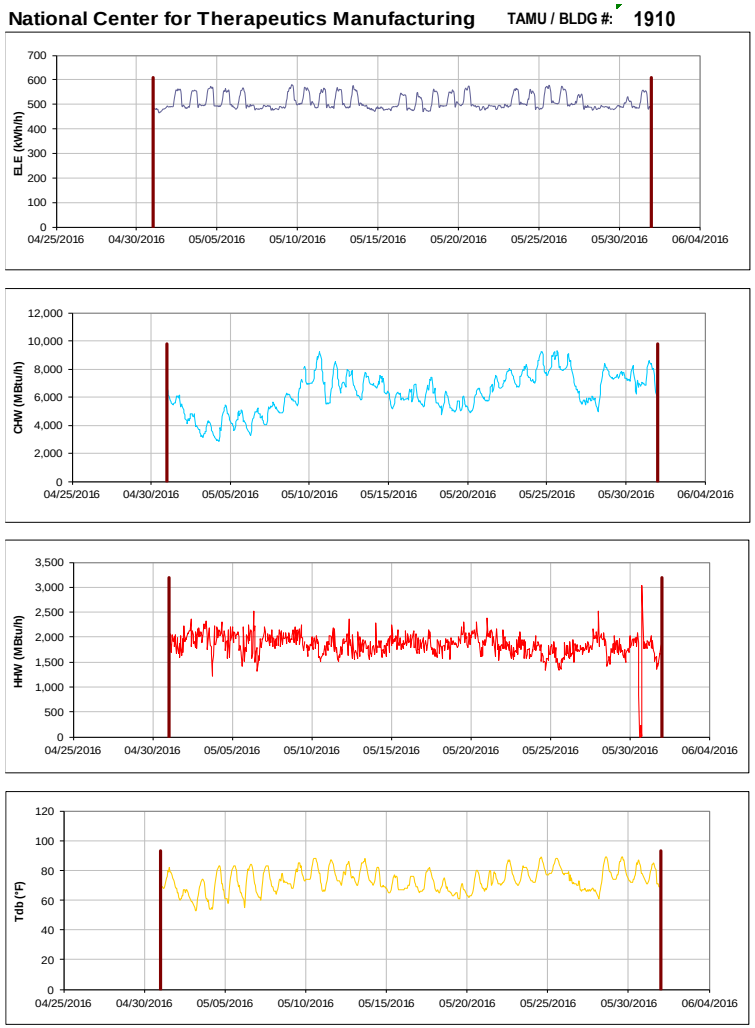


Figure III-188 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for National Center for Therapeutics Manufacturing during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

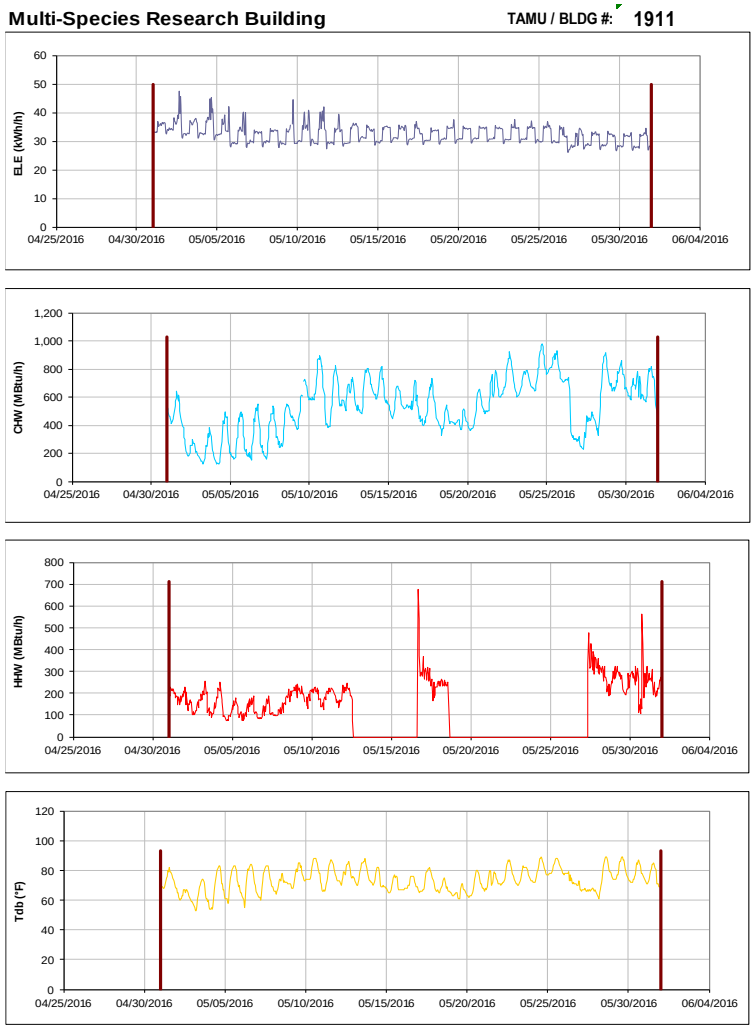


Figure III-189 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for Multi-Species Research Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

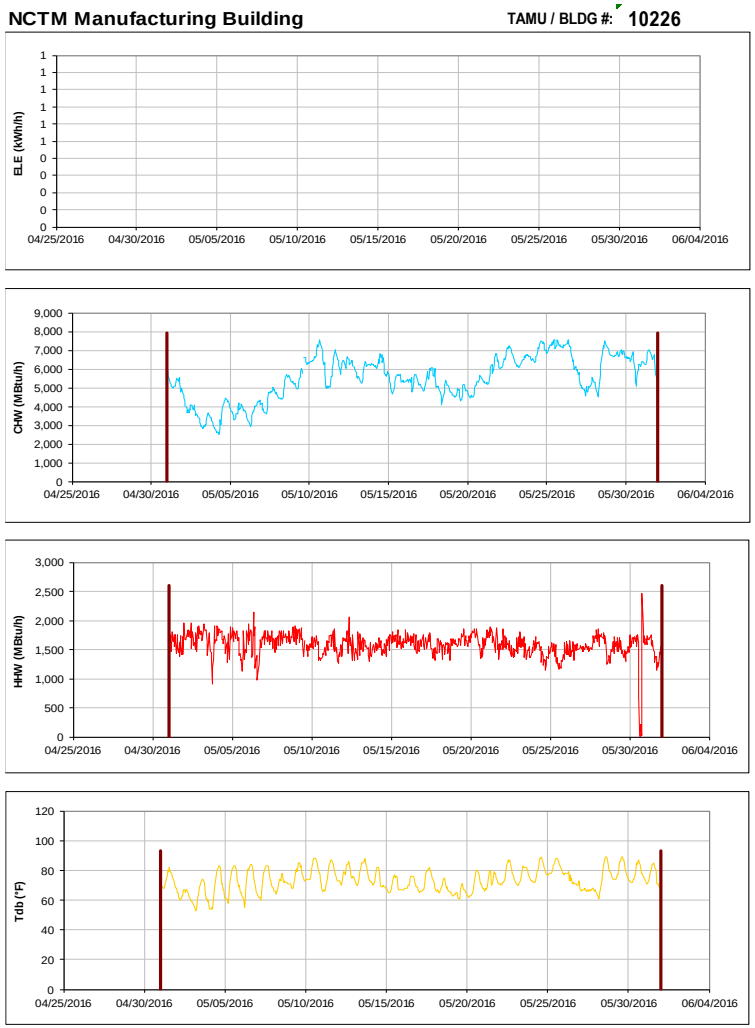


Figure III-190 Hourly Whole Building Electricity, Chilled Water, and Hot Water Consumption for NCTM Manufacturing Building during the Month of May 2016 and the Corresponding Hourly Outdoor Dry Bulb Temperature for College Station, TX

IV. Energy Balance Plots for May 2016 Consumption

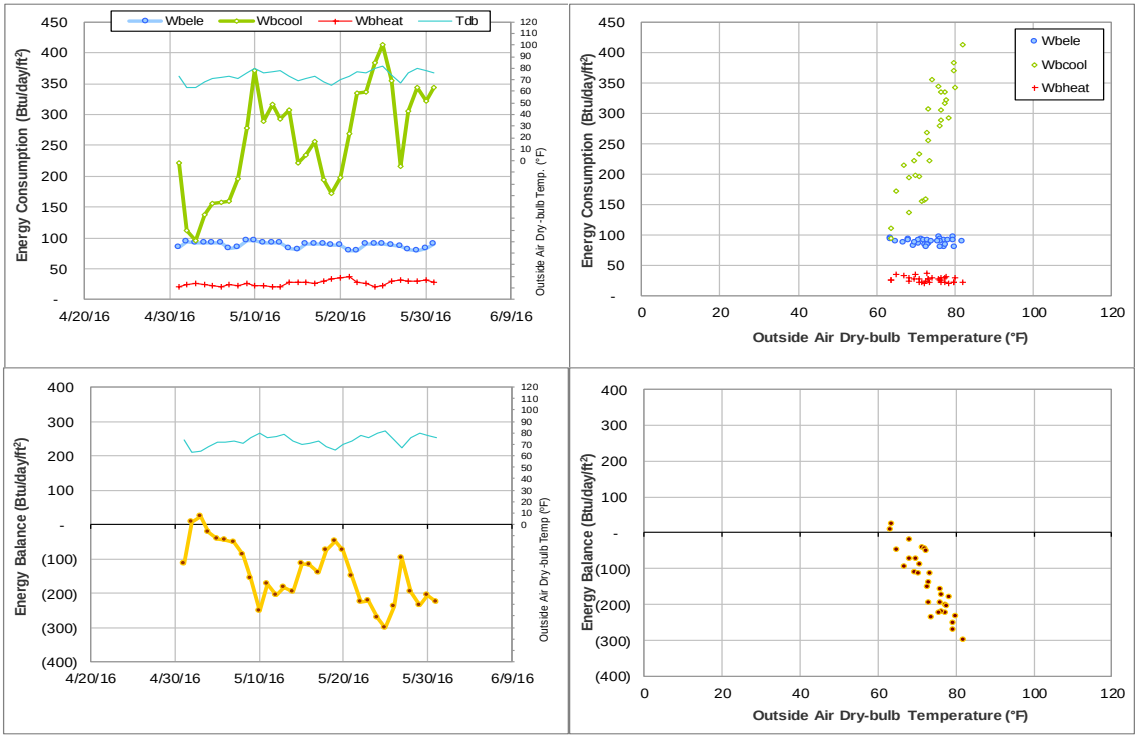


Figure IV-1 Emerging Technologies Building TAMU BLDG # 270 Energy Balance Plot during May 2016

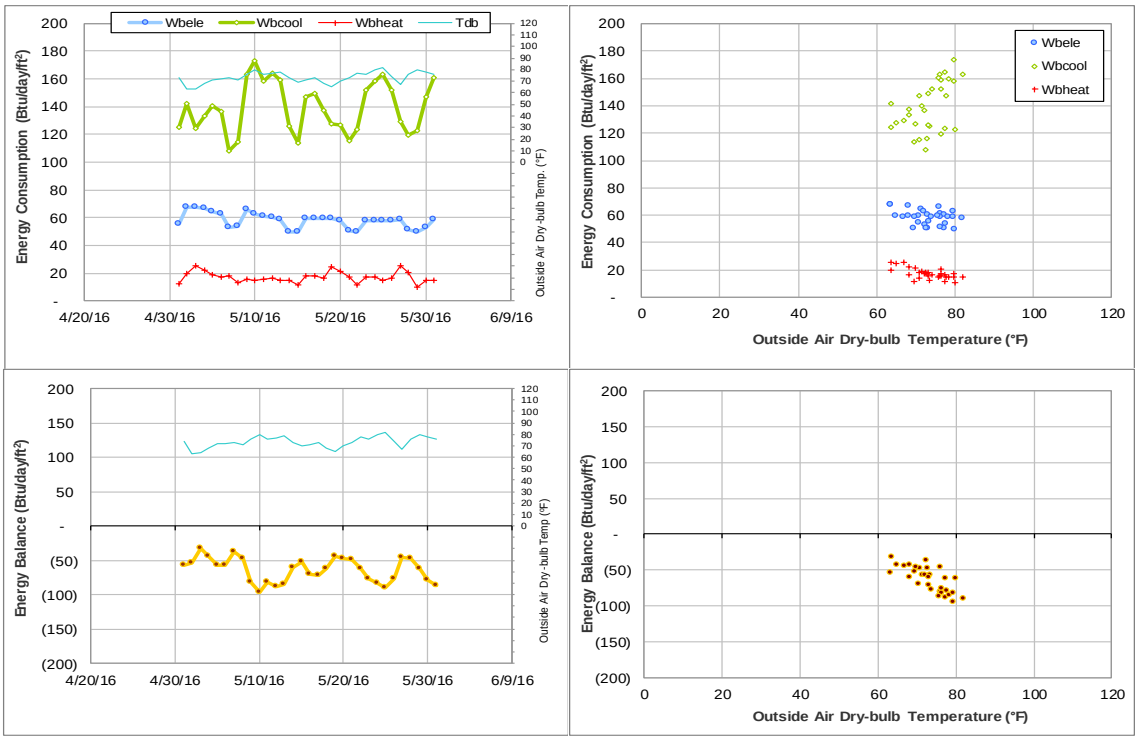


Figure IV-2 Liberal Arts and Arts & Humanities Building TAMU BLDG # 275 Energy Balance Plot during May 2016

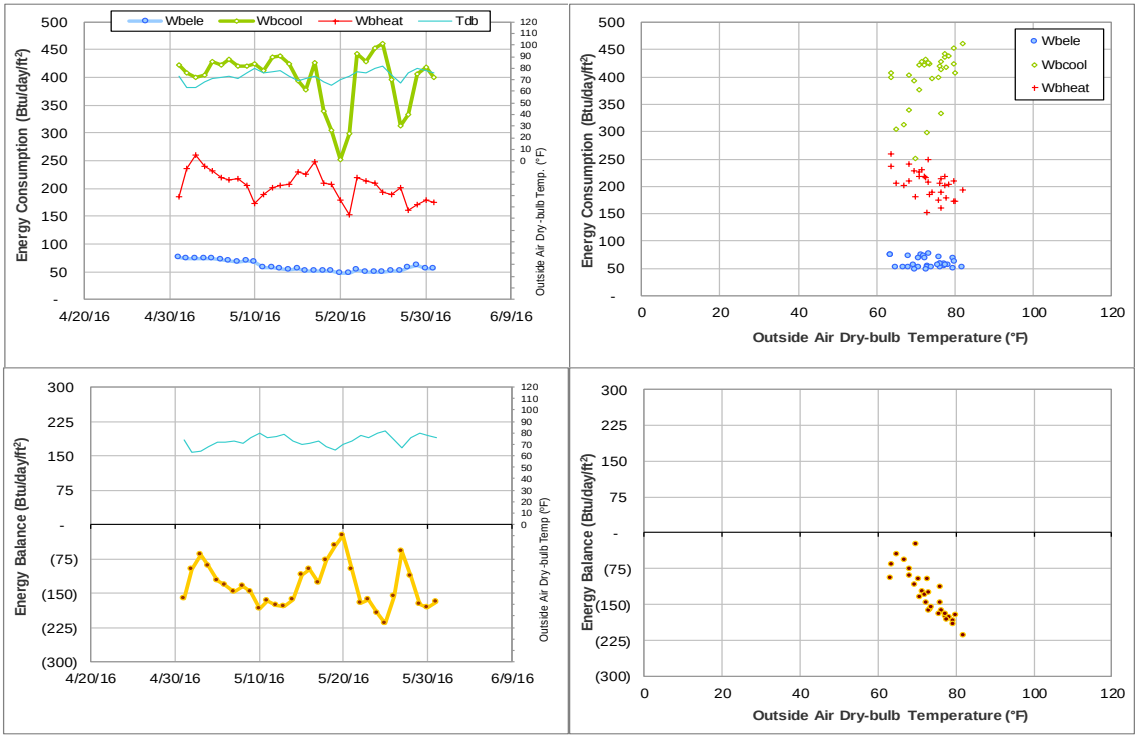


Figure IV-3 Wells Residence Hall TAMU BLDG # 290 Energy Balance Plot during May 2016

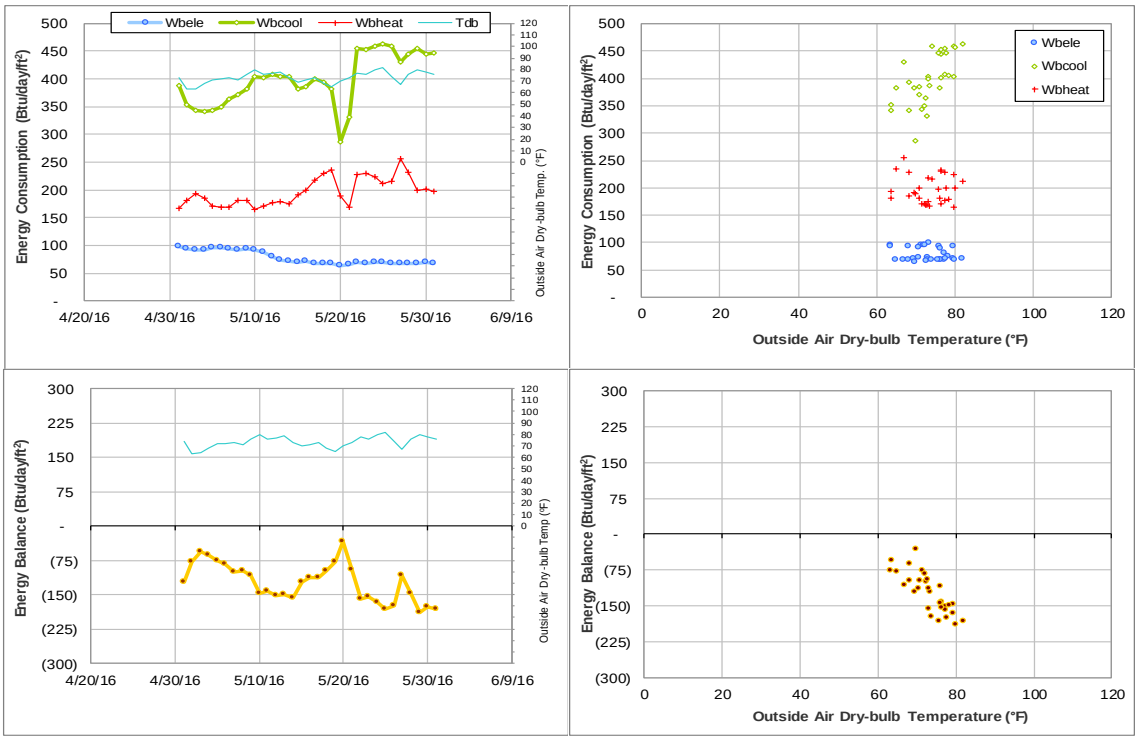


Figure IV-4 Rudder Residence Hall TAMU BLDG # 291 Energy Balance Plot during May 2016

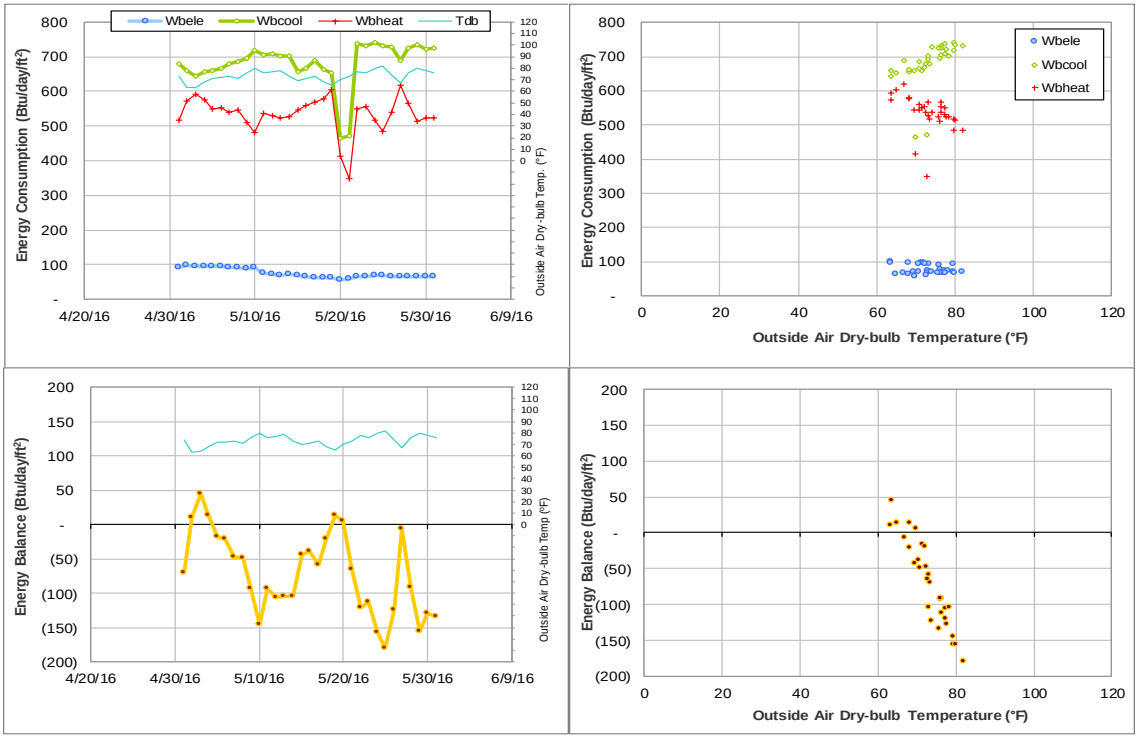


Figure IV-5 Eppright Residence Hall TAMU BLDG # 292 Energy Balance Plot during May 2016

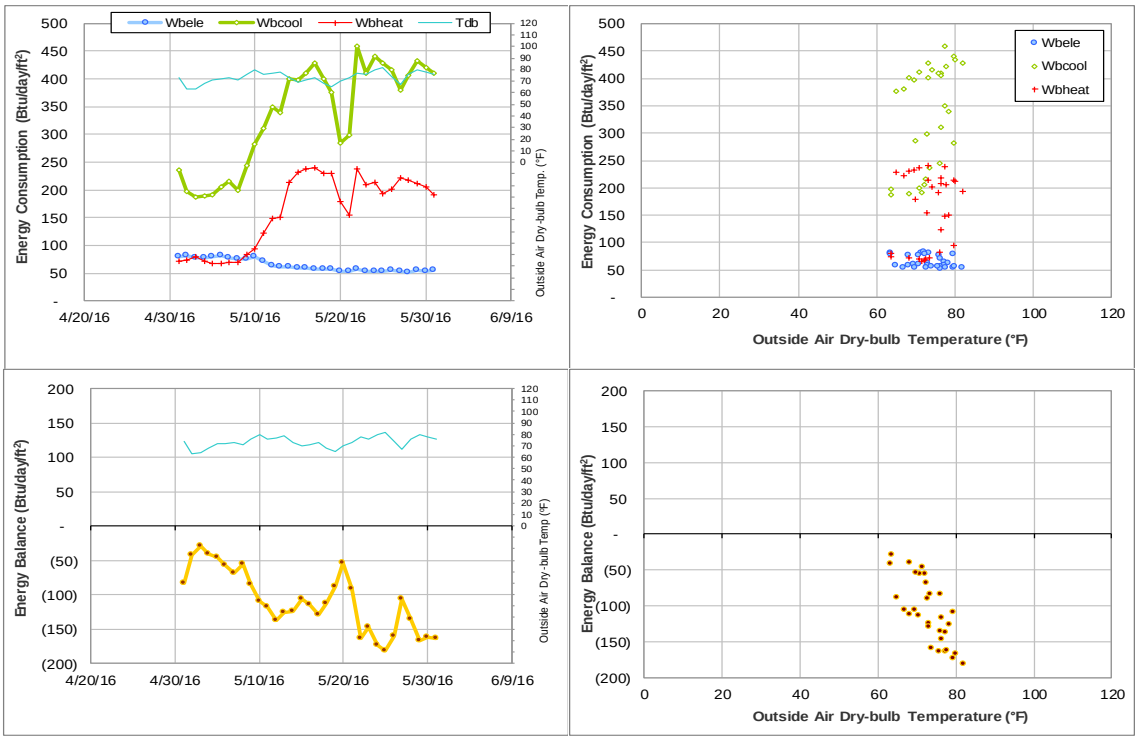


Figure IV-6 Appelt Residence Hall TAMU BLDG # 293 Energy Balance Plot during May 2016

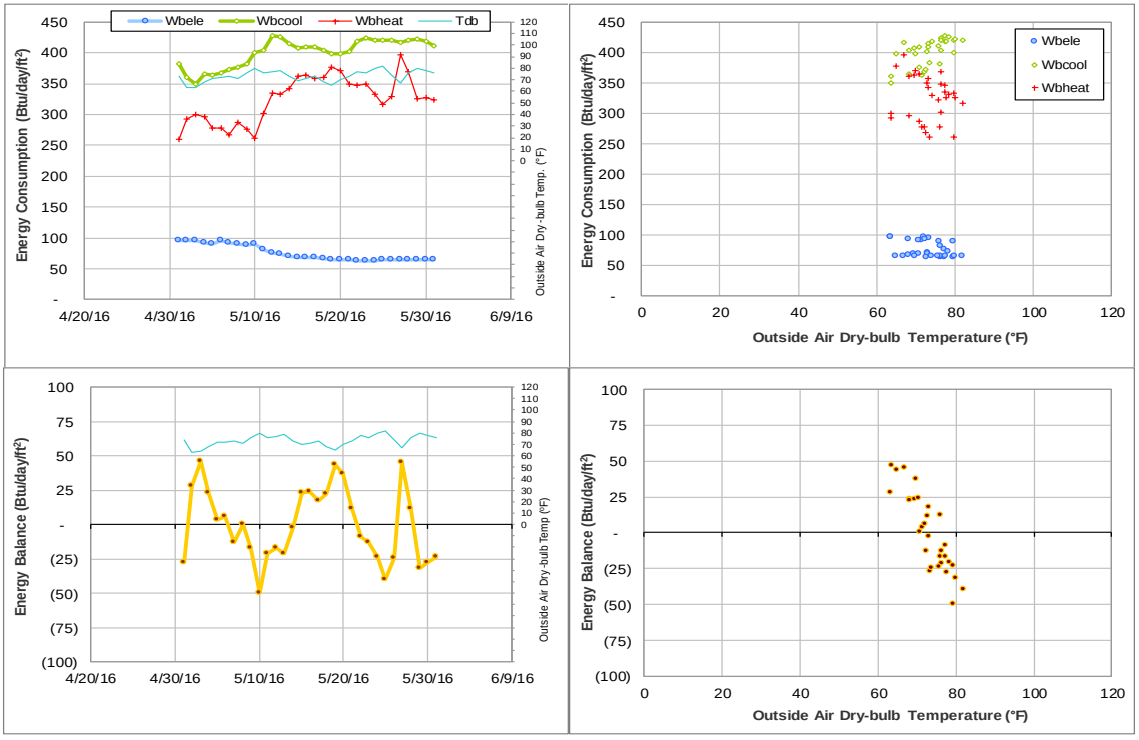


Figure IV-7 Lechner Residence Hall TAMU BLDG # 294 Energy Balance Plot during May 2016

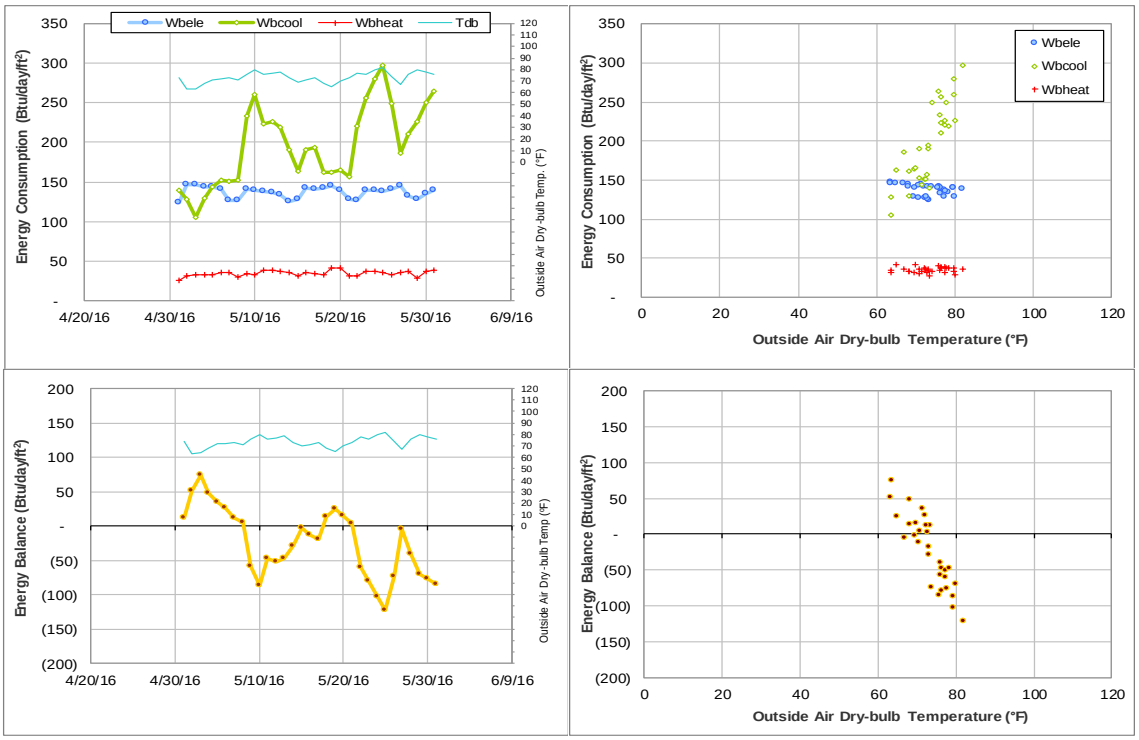


Figure IV-8 Mitchell Inst. for Fundamental Phys & Astronomy TAMU BLDG # 296 Energy Balance Plot during May 2016

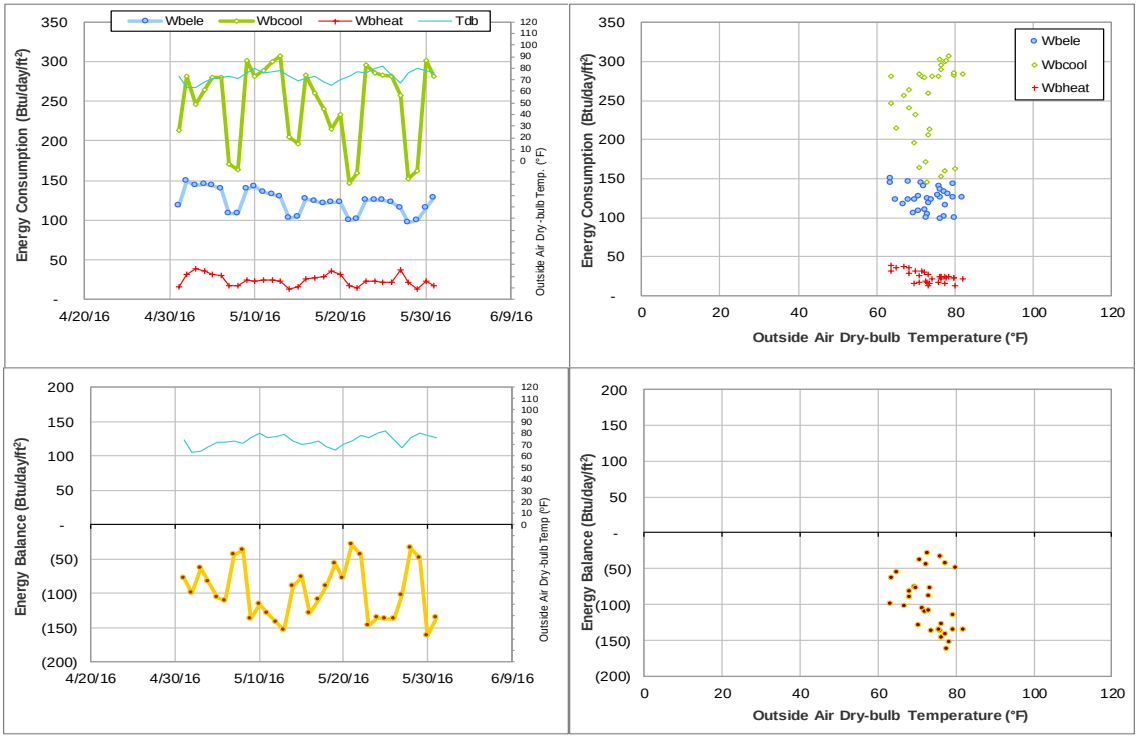


Figure IV-9 CE TTI Office & Lab Building TAMU BLDG # 325 Energy Balance Plot during May 2016

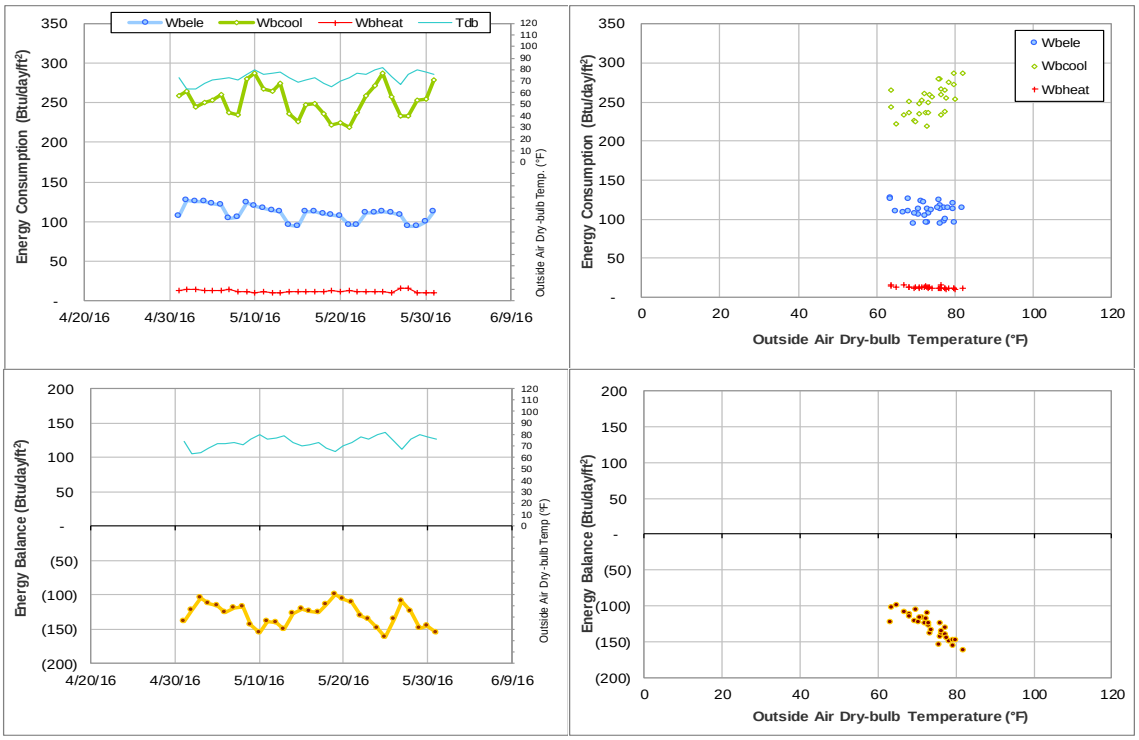


Figure IV-10 Bright Aerospace Building TAMU BLDG # 353 Energy Balance Plot during May 2016

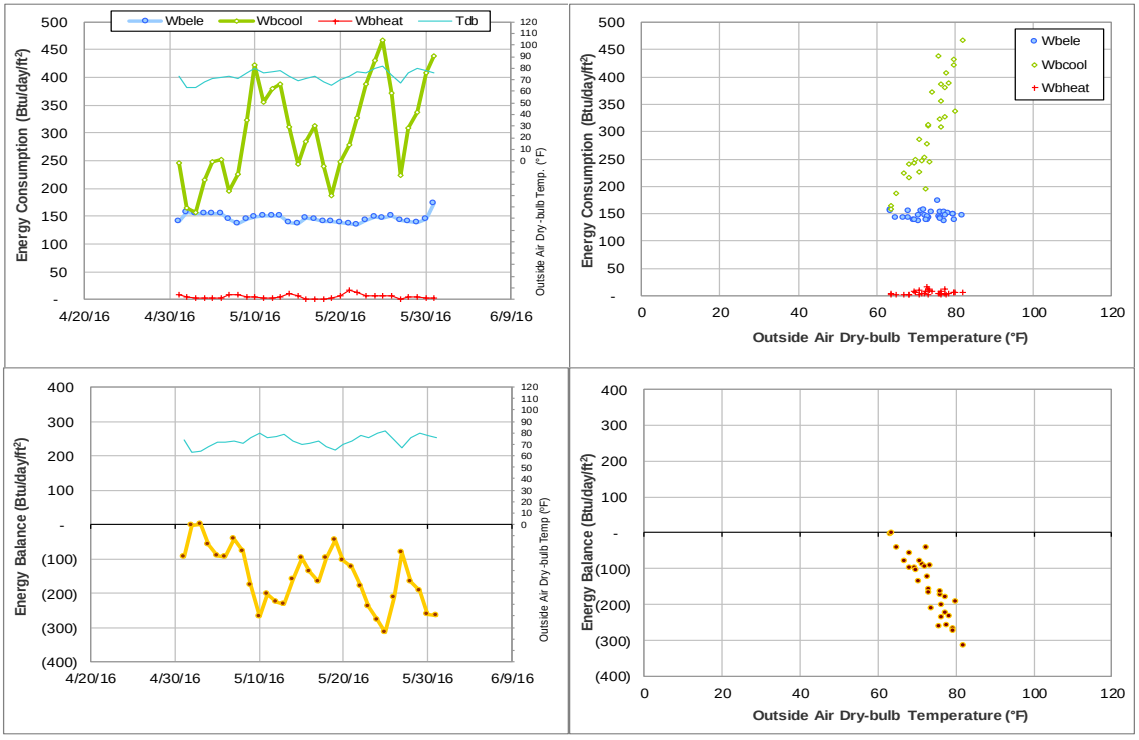


Figure IV-11 Davis Football Player Development Center TAMU BLDG # 358 Energy Balance Plot during May 2016

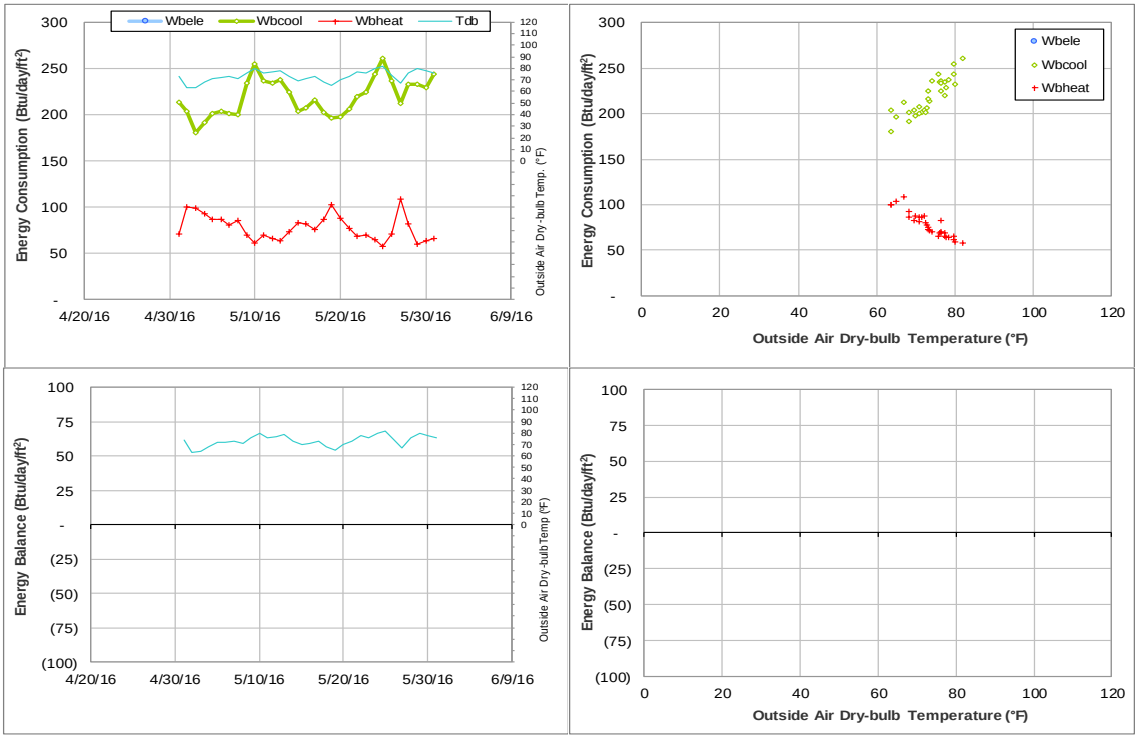


Figure IV-12 Architecture Building B&C TAMU BLDG # 359 Energy Balance Plot during May 2016

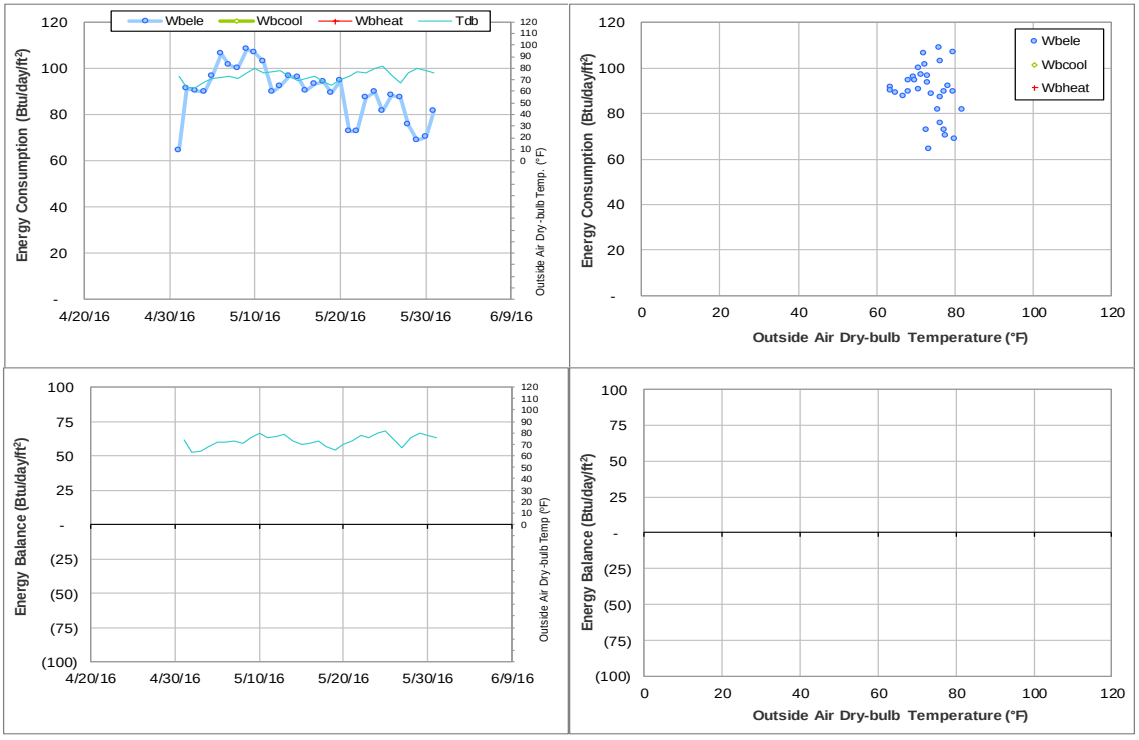


Figure IV-13 Architecture Building B TAMU BLDG # 359 Energy Balance Plot during May 2016

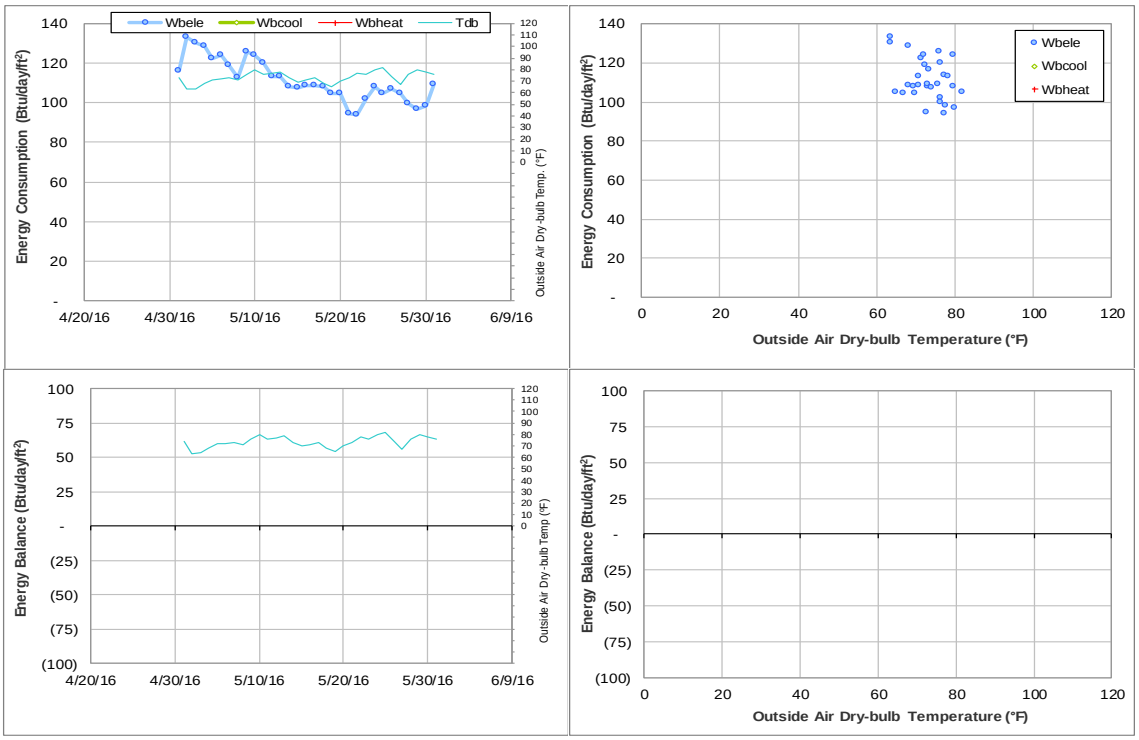


Figure IV-14 Architecture Building C TAMU BLDG # 432 Energy Balance Plot during May 2016

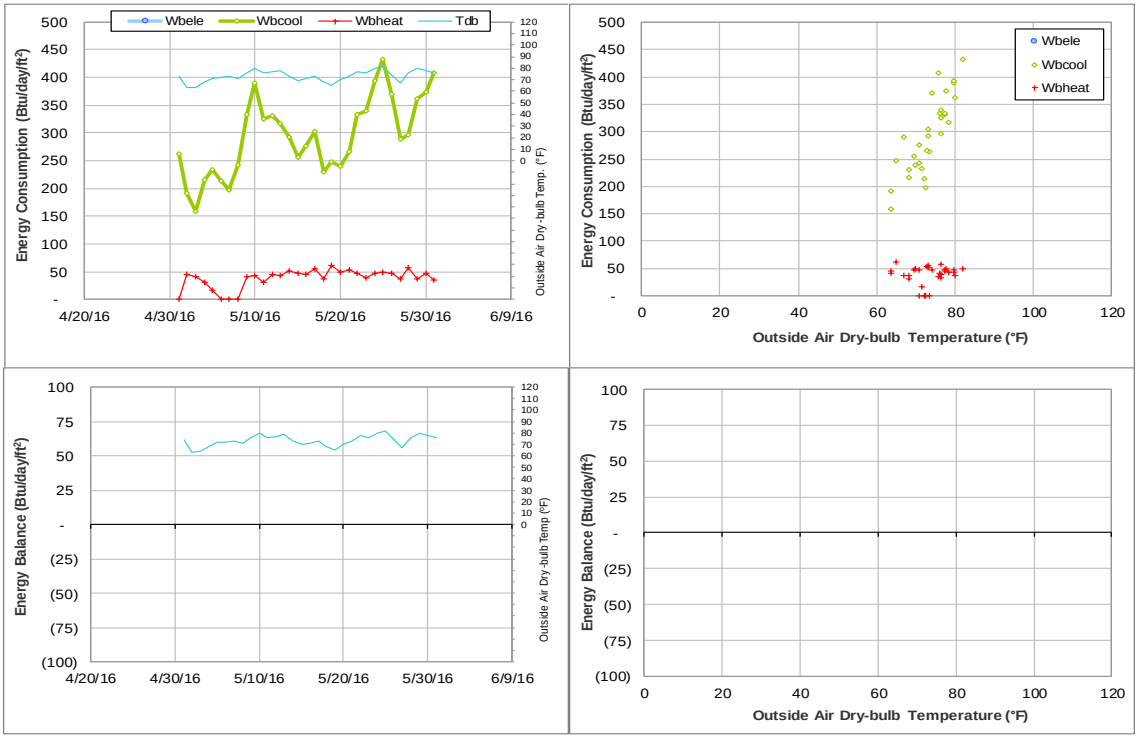


Figure IV-15 Bright Football Complex TAMU BLDG # 361 Energy Balance Plot during May 2016

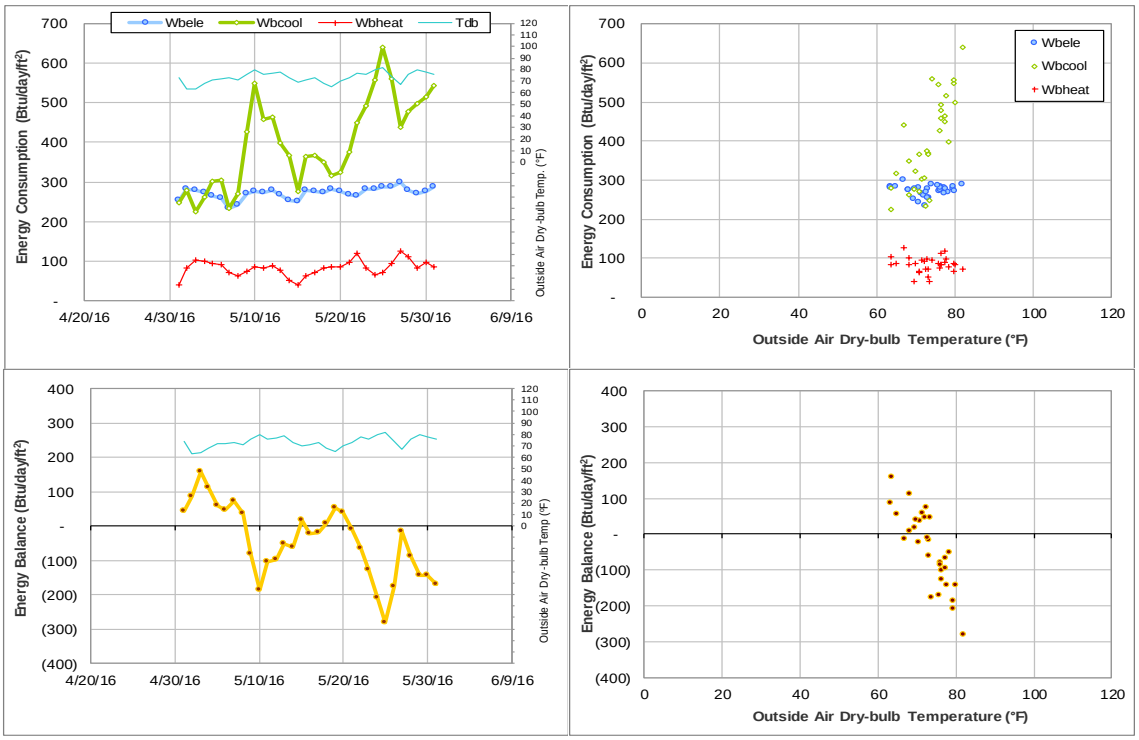


Figure IV-16 Kyle Field TAMU BLDG # 367 Energy Balance Plot during May 2016

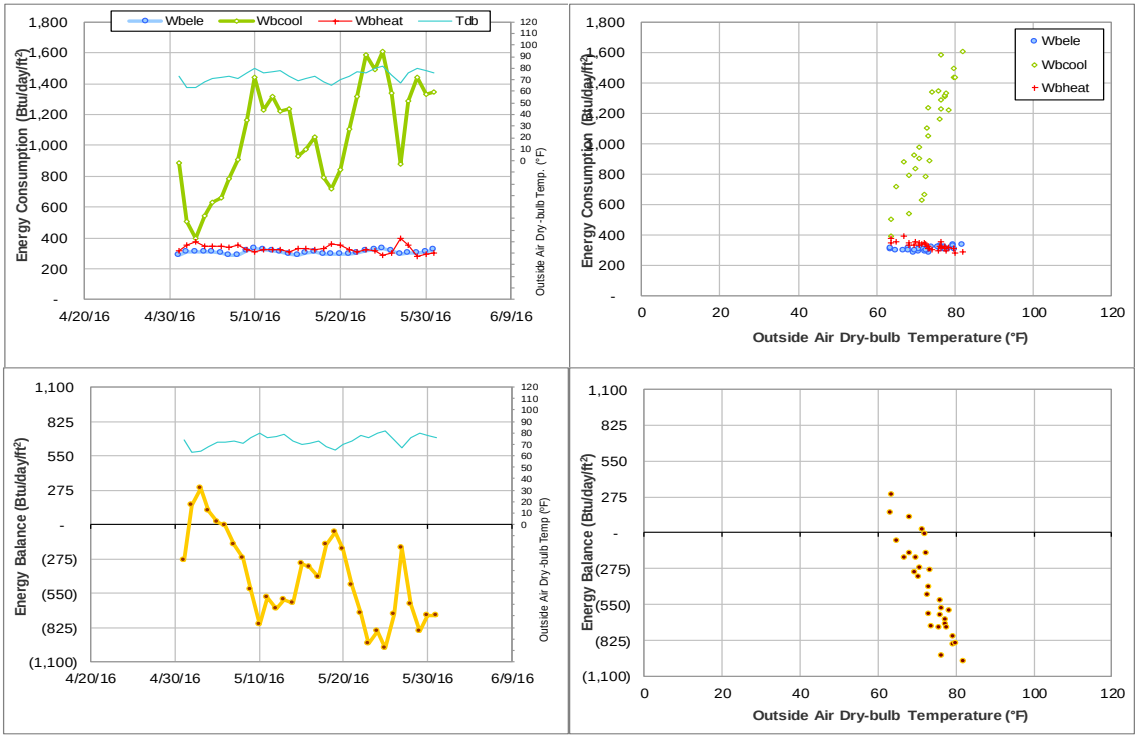


Figure IV-17 Chemistry Building Addition TAMU BLDG # 376 Energy Balance Plot during May 2016

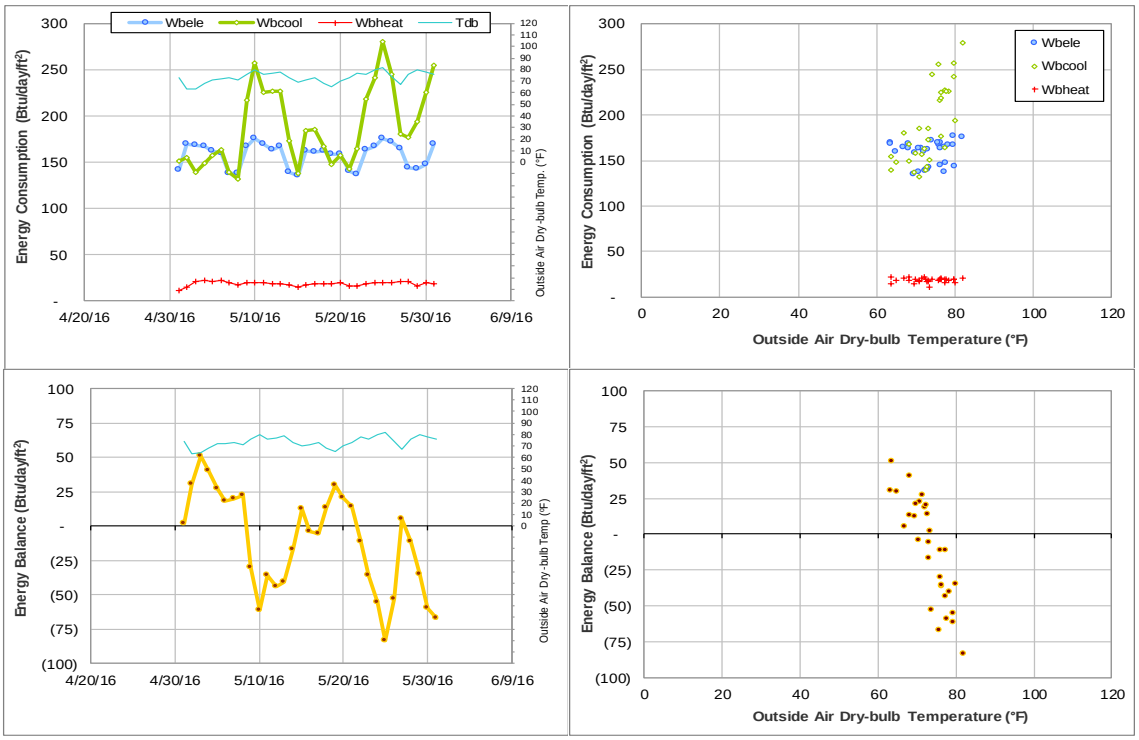


Figure IV-18 Koldus Building TAMU BLDG # 383 Energy Balance Plot during May 2016

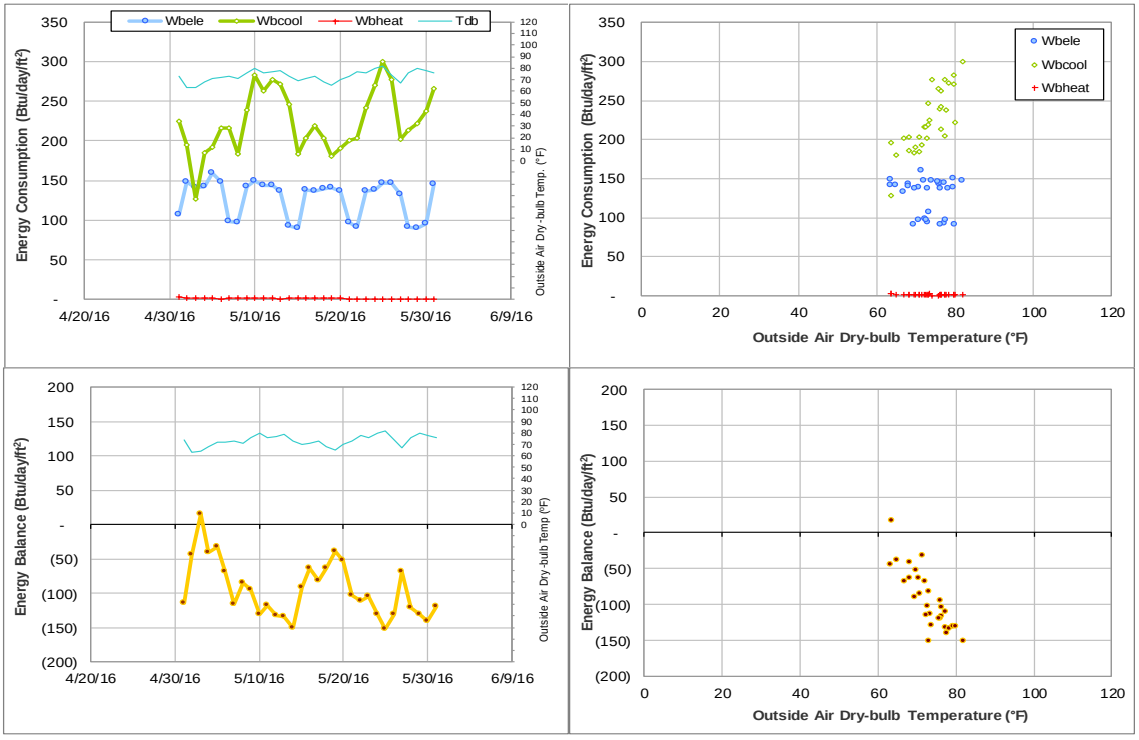


Figure IV-19 Sanders Corps of Cadets Center TAMU BLDG # 384 Energy Balance Plot during May 2016

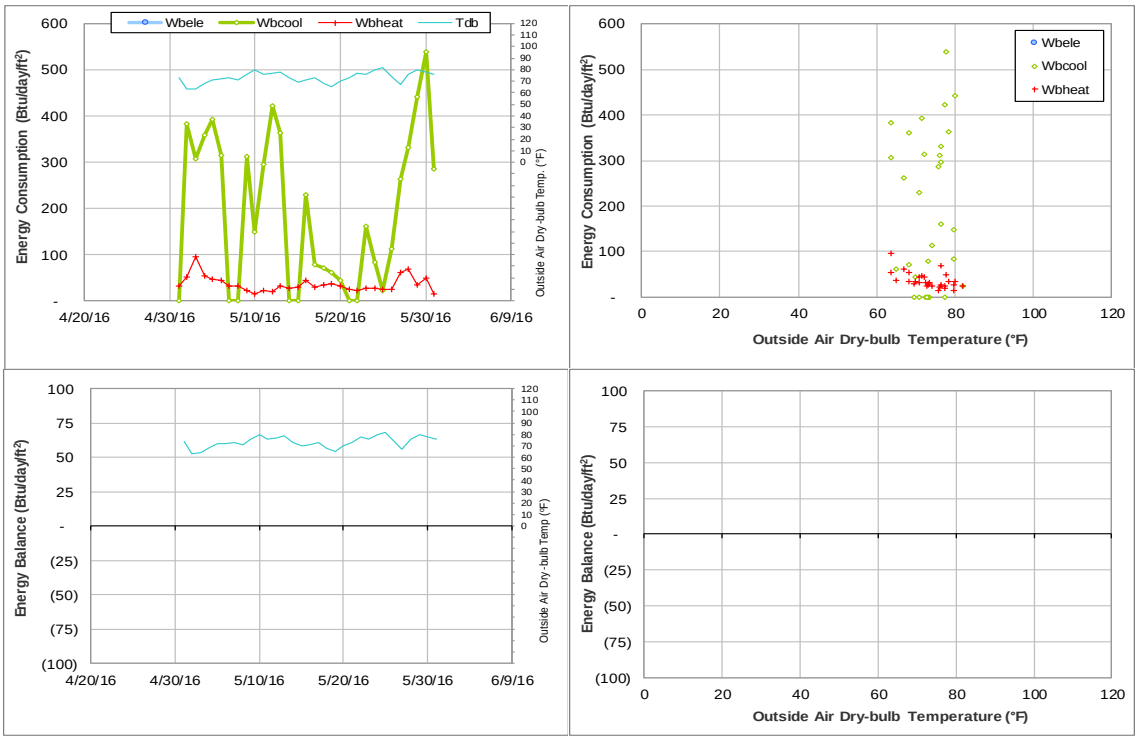


Figure IV-20 CE TTI Office & Lab Building - Pi R Square TAMU BLDG # 385 Energy Balance Plot during May 2016

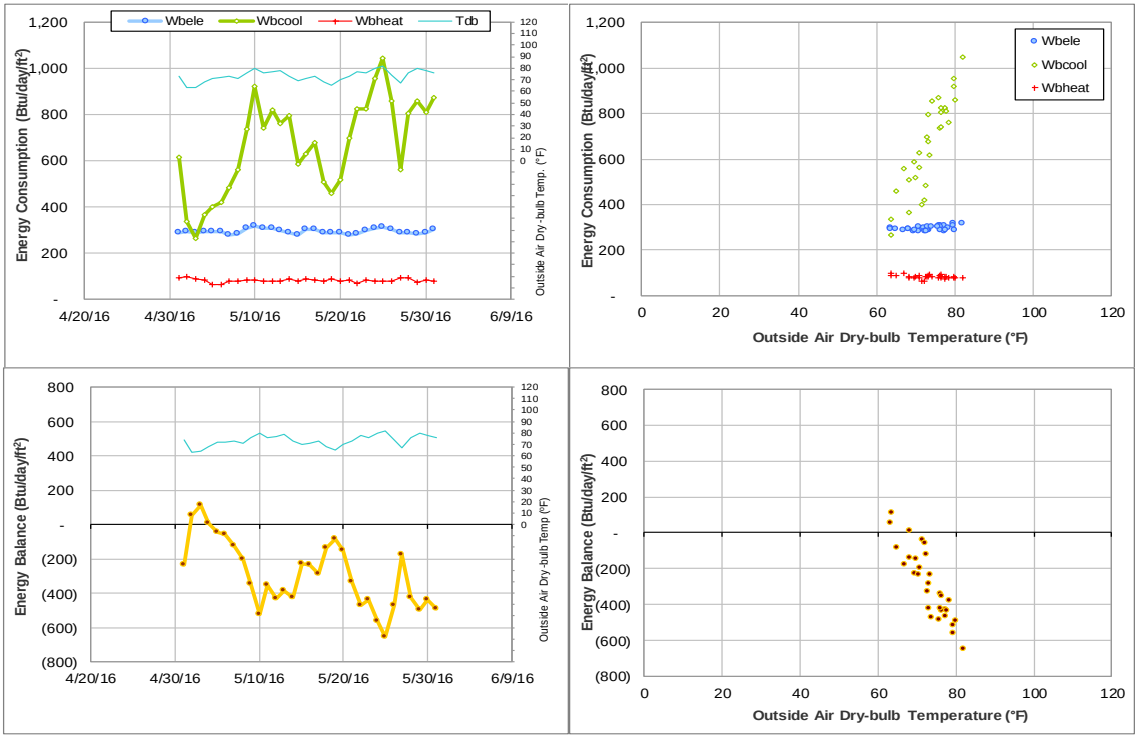


Figure IV-21 Jack E. Brown Chemical Engineering Building TAMU BLDG # 386 Energy Balance Plot during May 2016

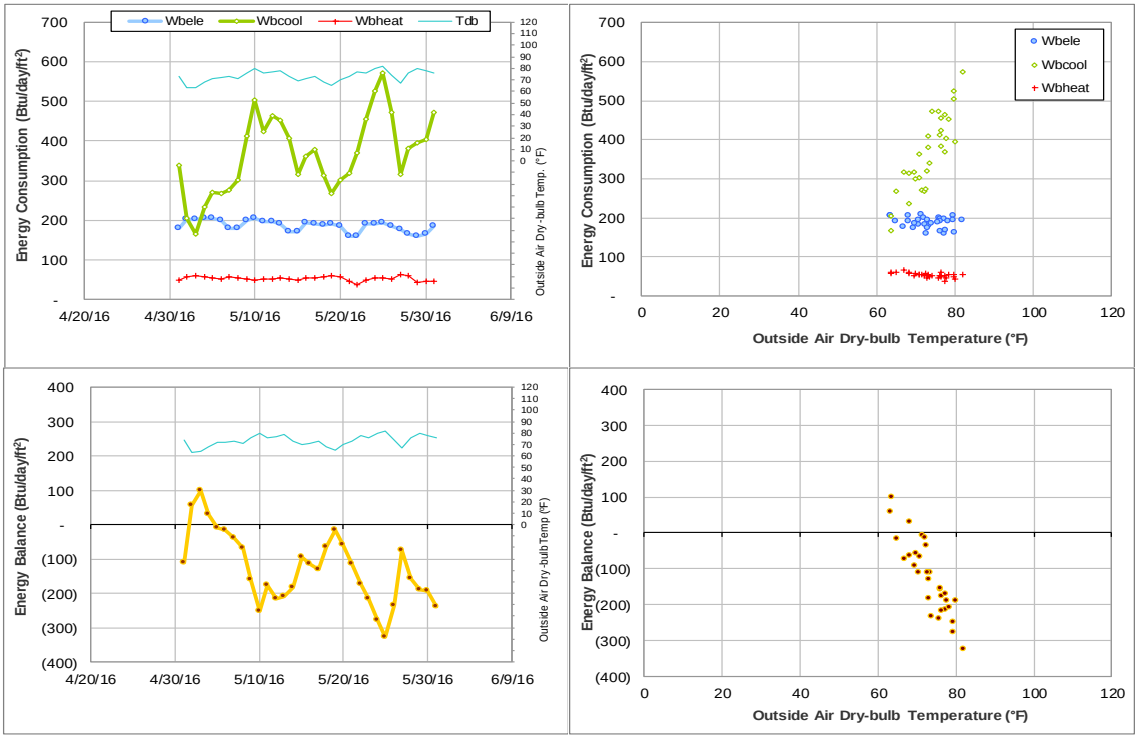


Figure IV-22 Richardson Petroleum Engineering Building TAMU BLDG # 387 Energy Balance Plot during May 2016

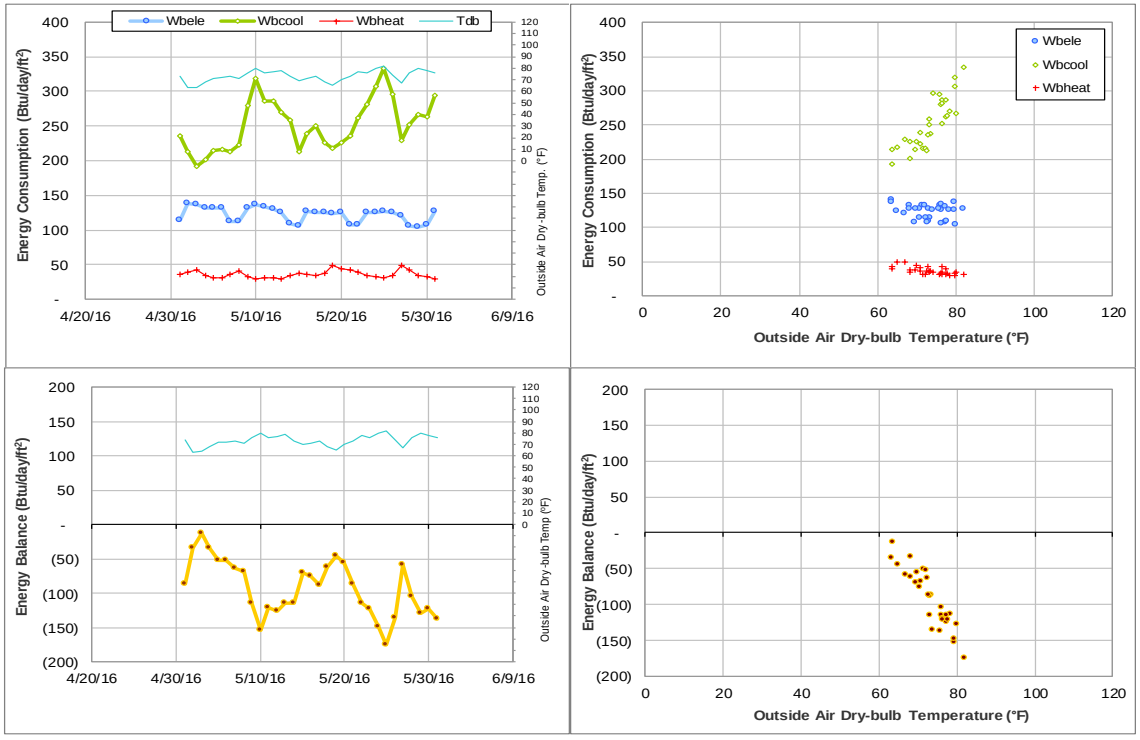


Figure IV-23 James J. Cain'51 and Mechanical Engineering Office Building TAMU BLDG # 391 Energy Balance Plot during May 2016

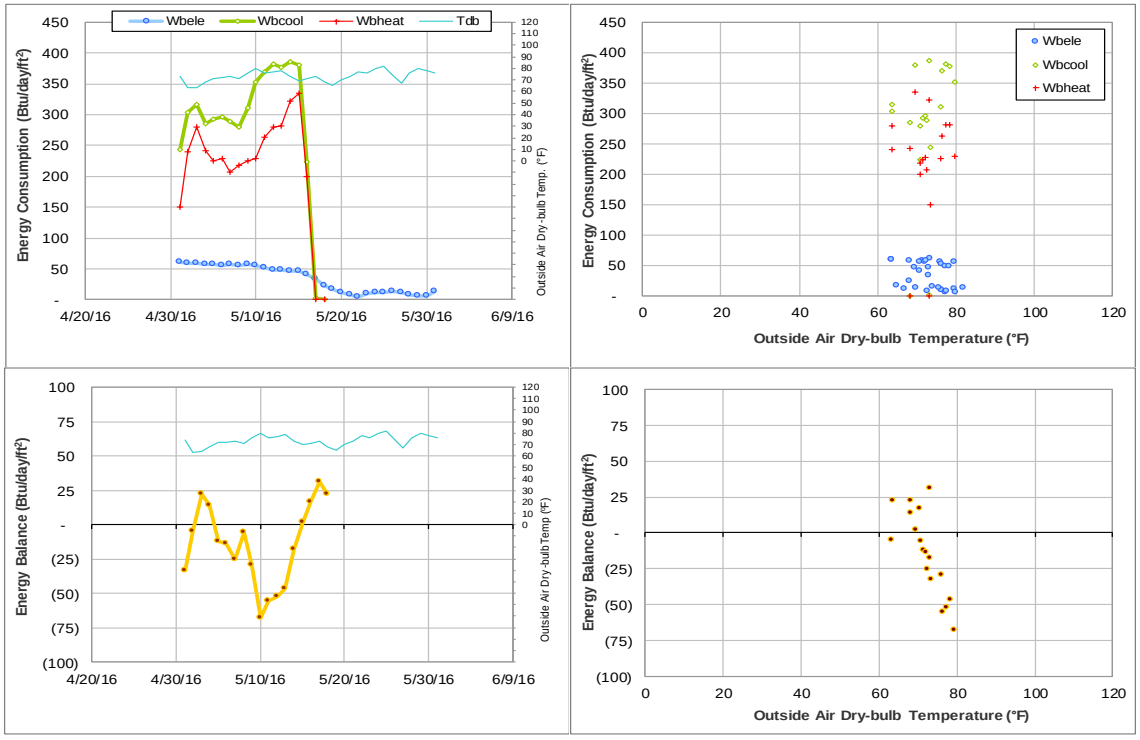


Figure IV-24 Underwood Residence Hall TAMU BLDG # 394 Energy Balance Plot during May 2016

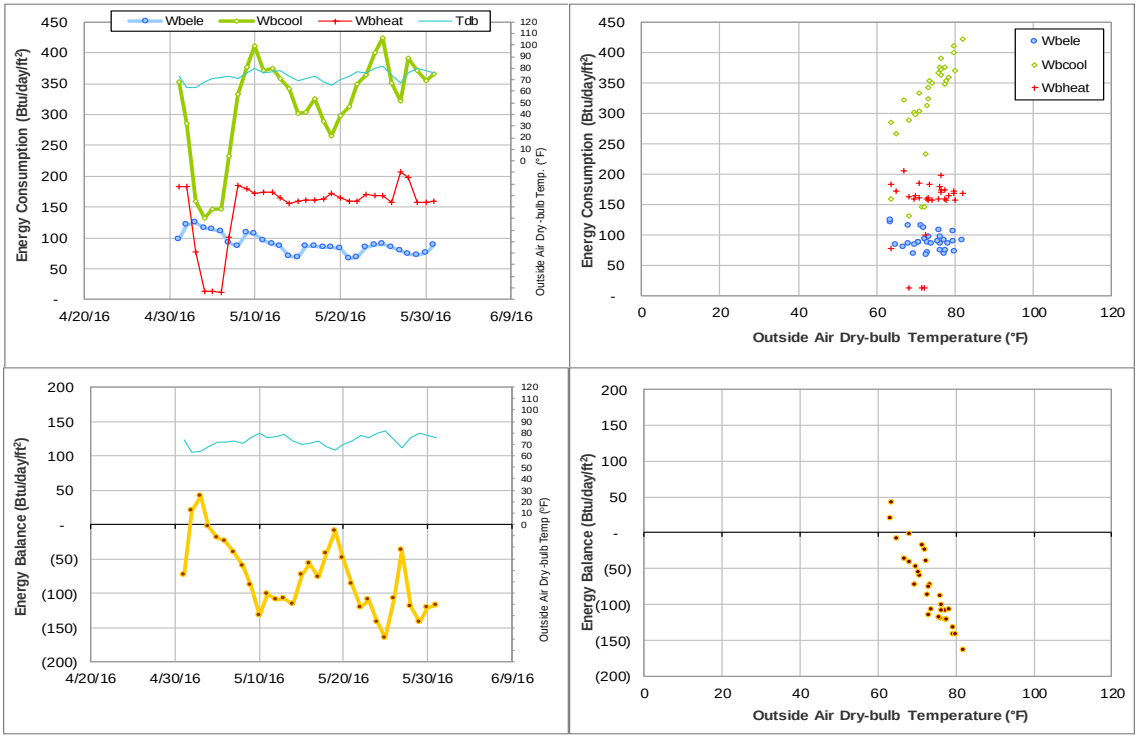


Figure IV-25 Langford Architecture Center Building A TAMU BLDG # 398 Energy Balance Plot during May 2016

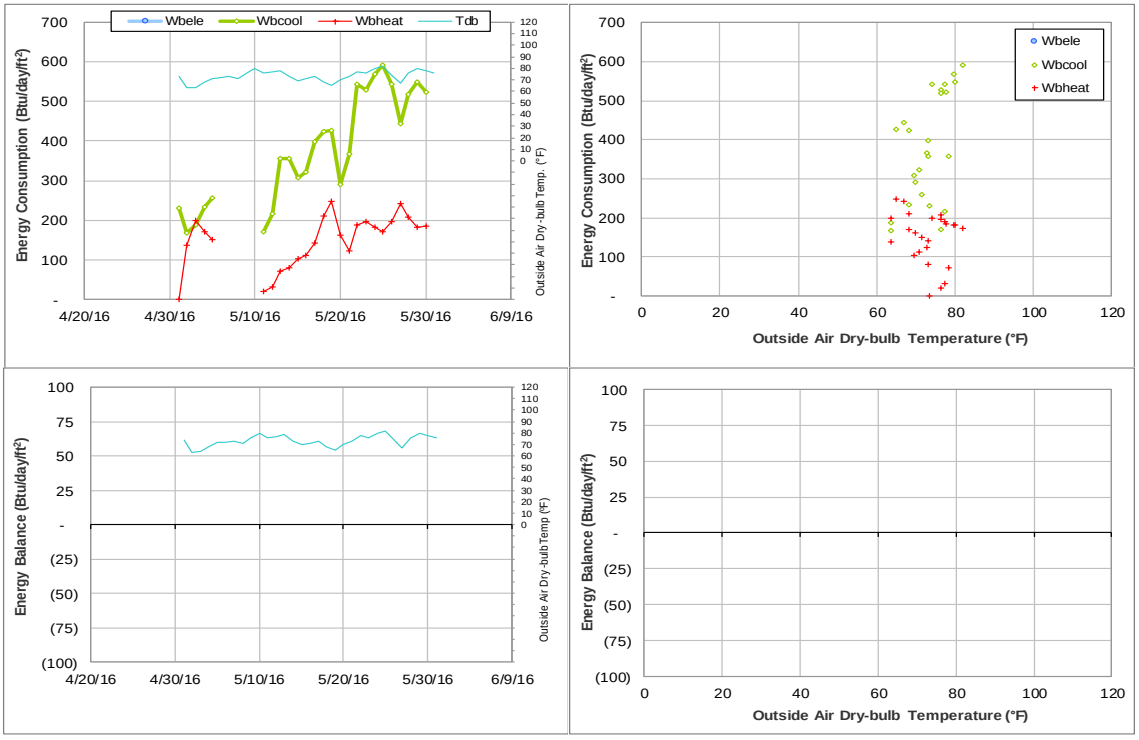


Figure IV-26 Spence Hall Dorm 1 TAMU BLDG # 400 Energy Balance Plot during May 2016

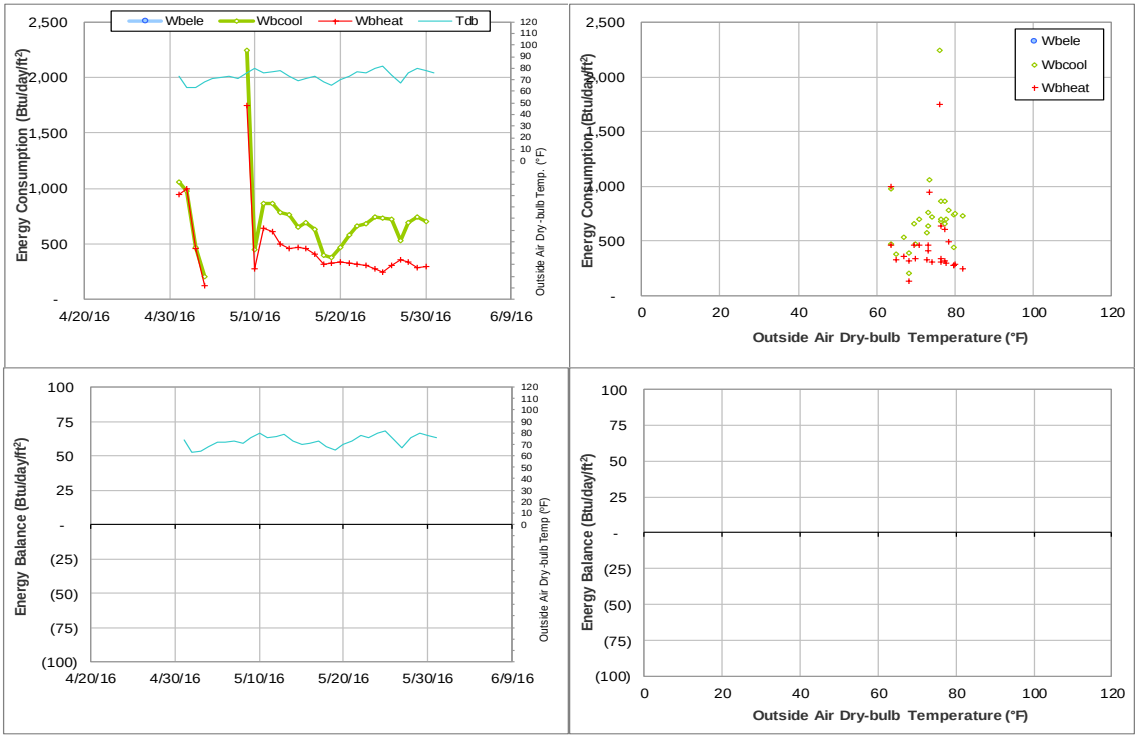


Figure IV-27 Kiest Hall Dorm 2 TAMU BLDG # 401 Energy Balance Plot during May 2016

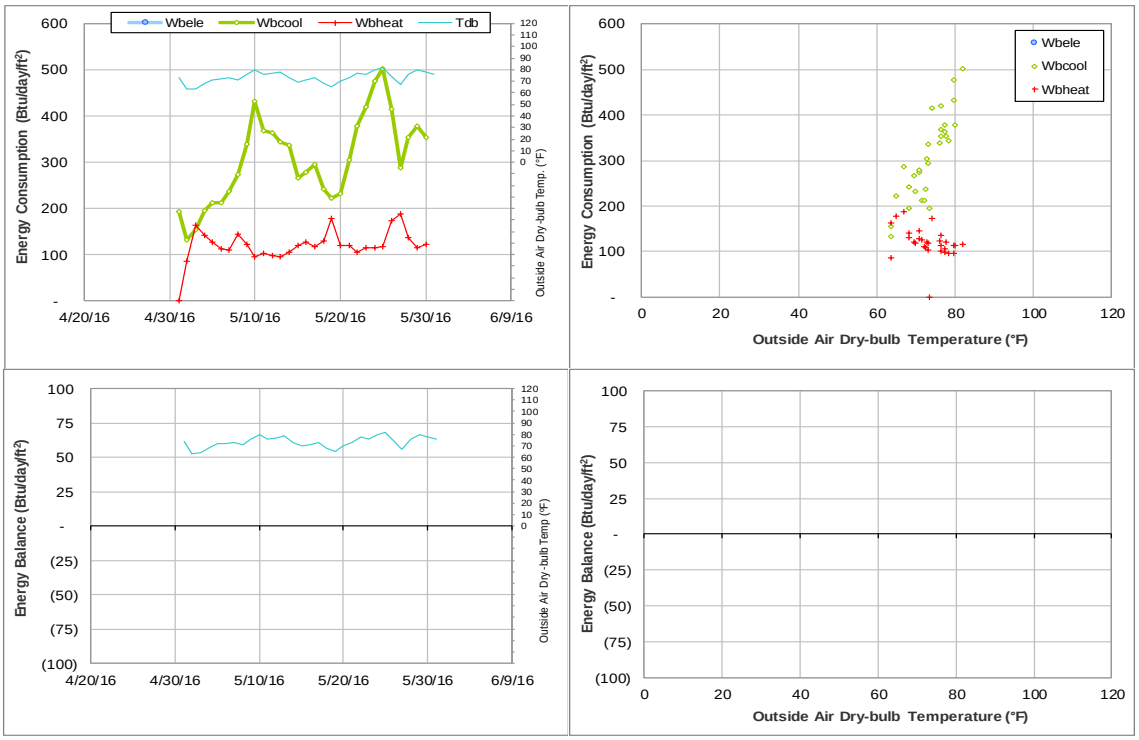


Figure IV-28 Briggs Hall Dorm 3 TAMU BLDG # 402 Energy Balance Plot during May 2016

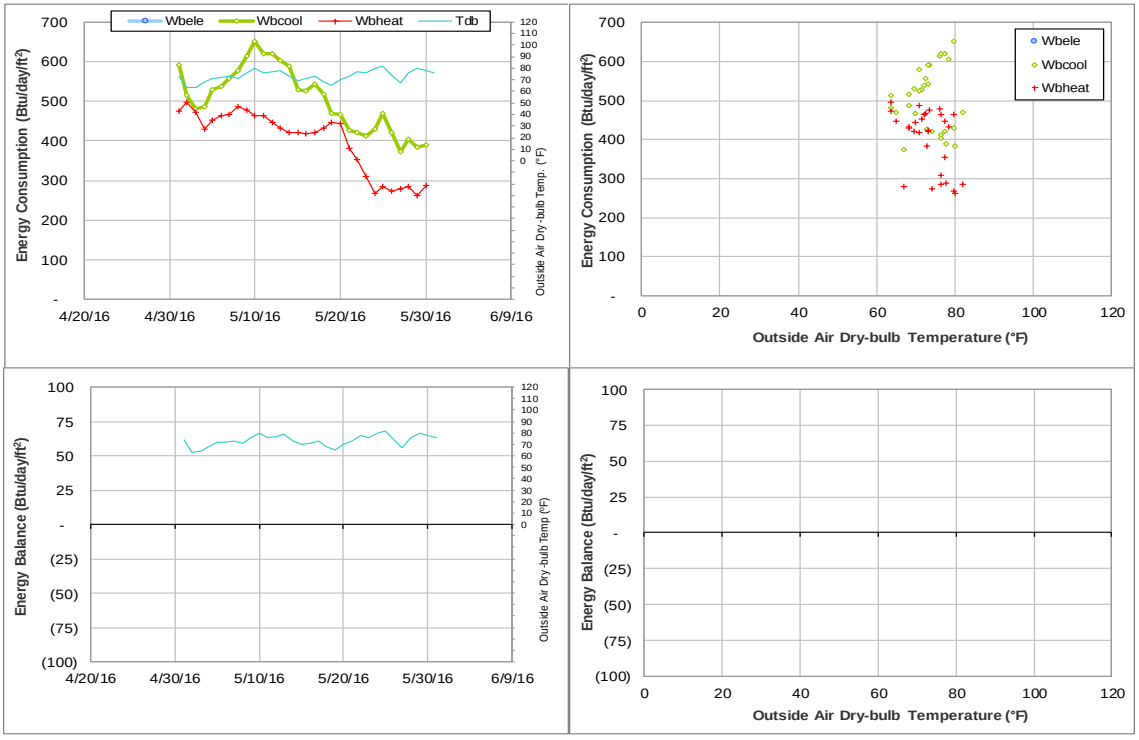


Figure IV-29 Fountain Hall Dorm 4 TAMU BLDG # 403 Energy Balance Plot during May 2016

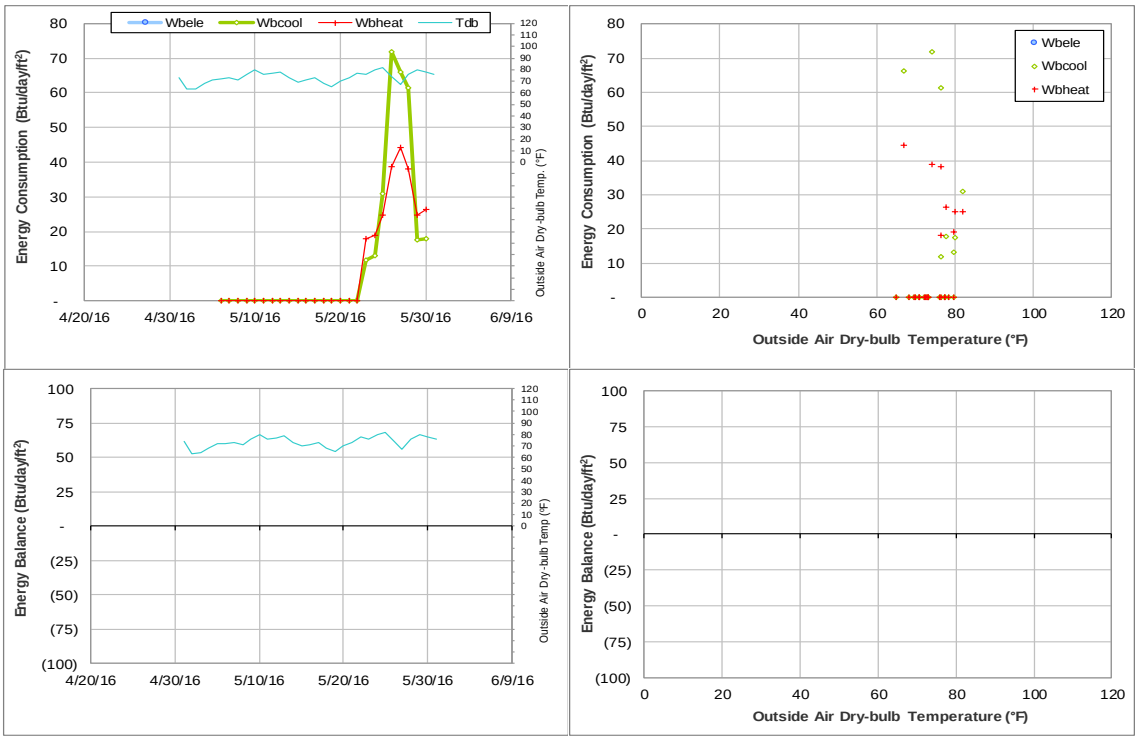


Figure IV-30 Gainer Hall Dorm 5 TAMU BLDG # 404 Energy Balance Plot during May 2016

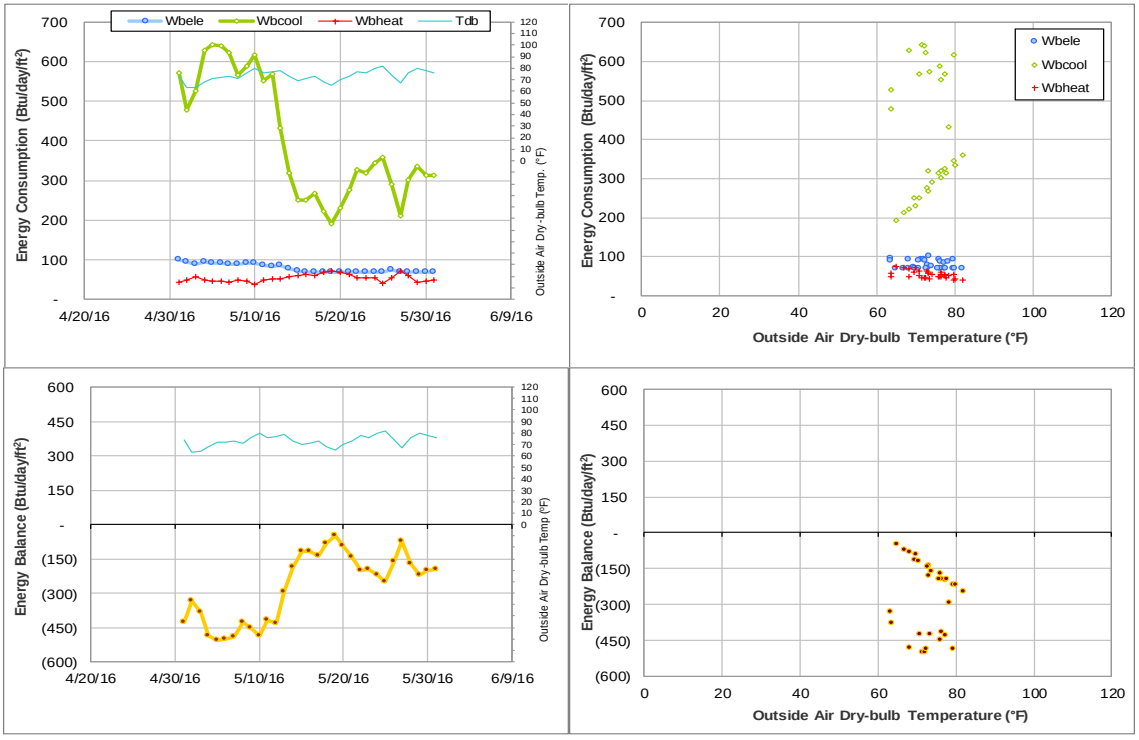


Figure IV-31 Lacy Hall - Dorm 6, Harrell Hall and Leadership Learning Center TAMU BLDG # 405-407-1402 Energy Balance Plot during May 2016

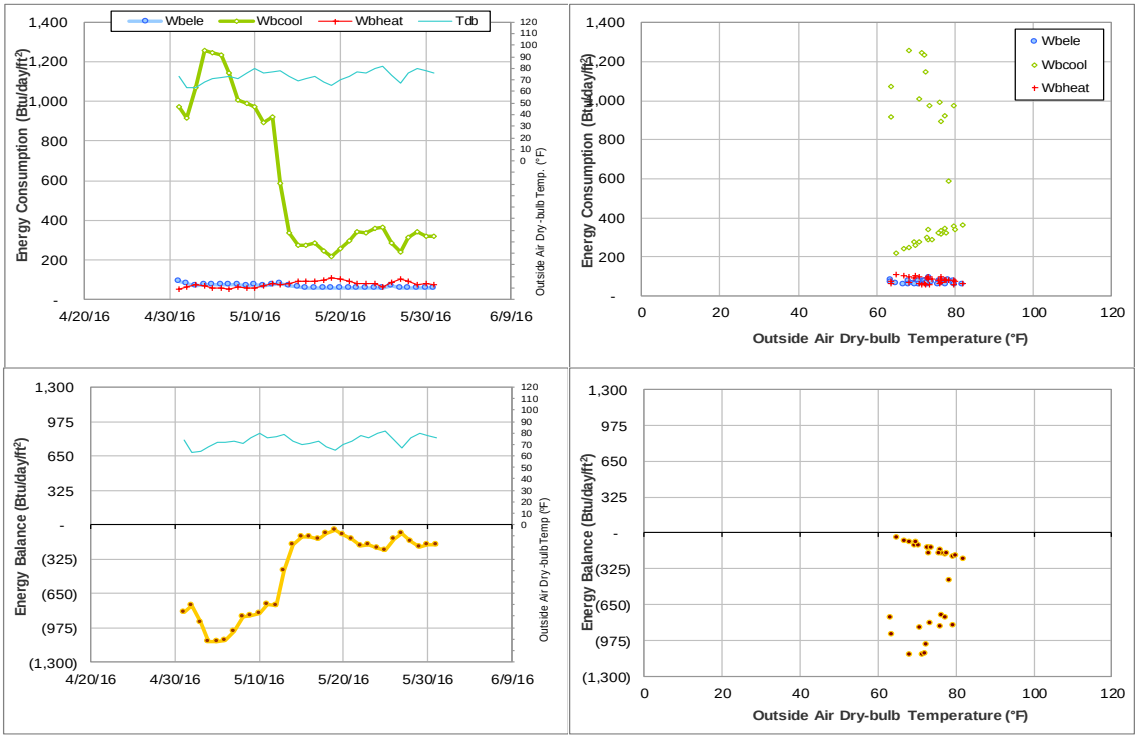


Figure IV-32 Lacy Hall - Dorm 6 TAMU BLDG # 405 Energy Balance Plot during May 2016

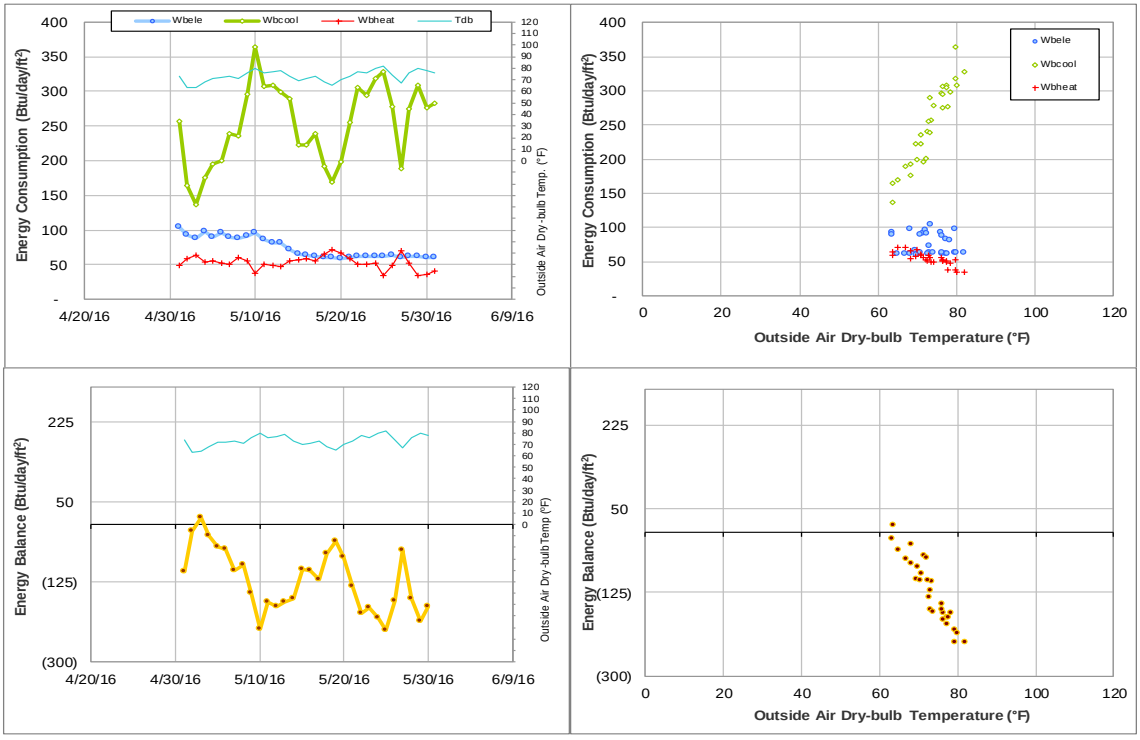


Figure IV-33 Harrell Hall - Dorm 8 TAMU BLDG # 407 Energy Balance Plot during May 2016

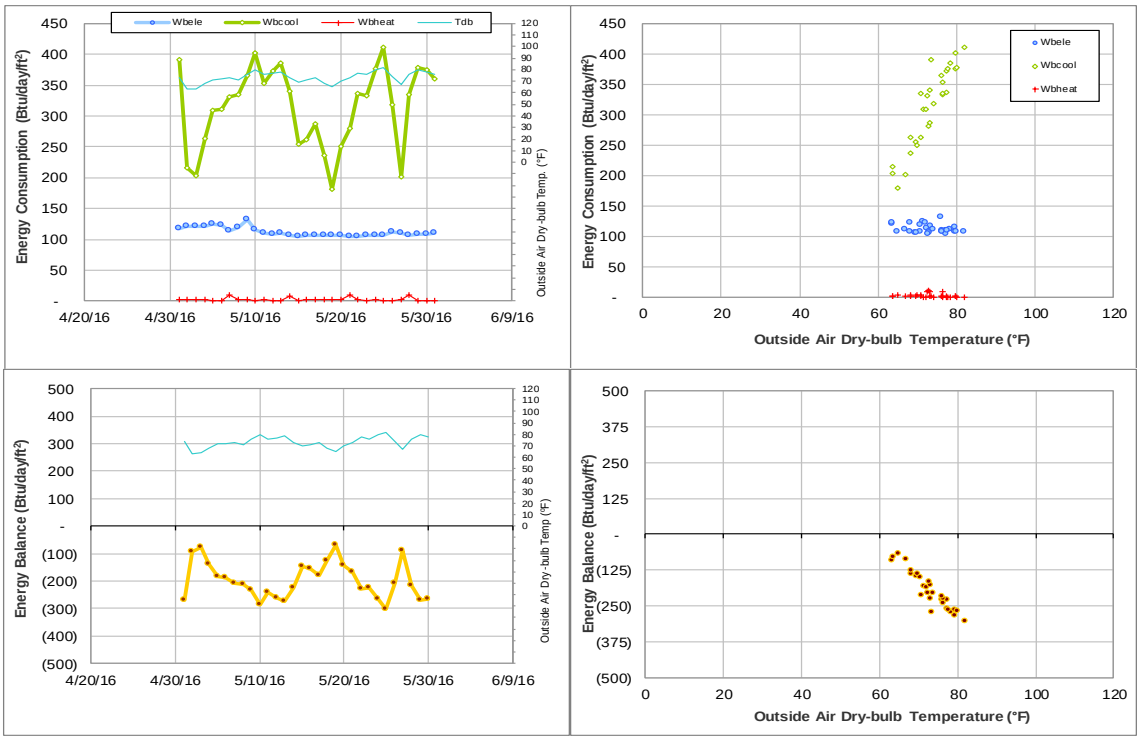


Figure IV-34 Buzbee Leadership Learning Center TAMU BLDG # 1402 Energy Balance Plot during May 2016

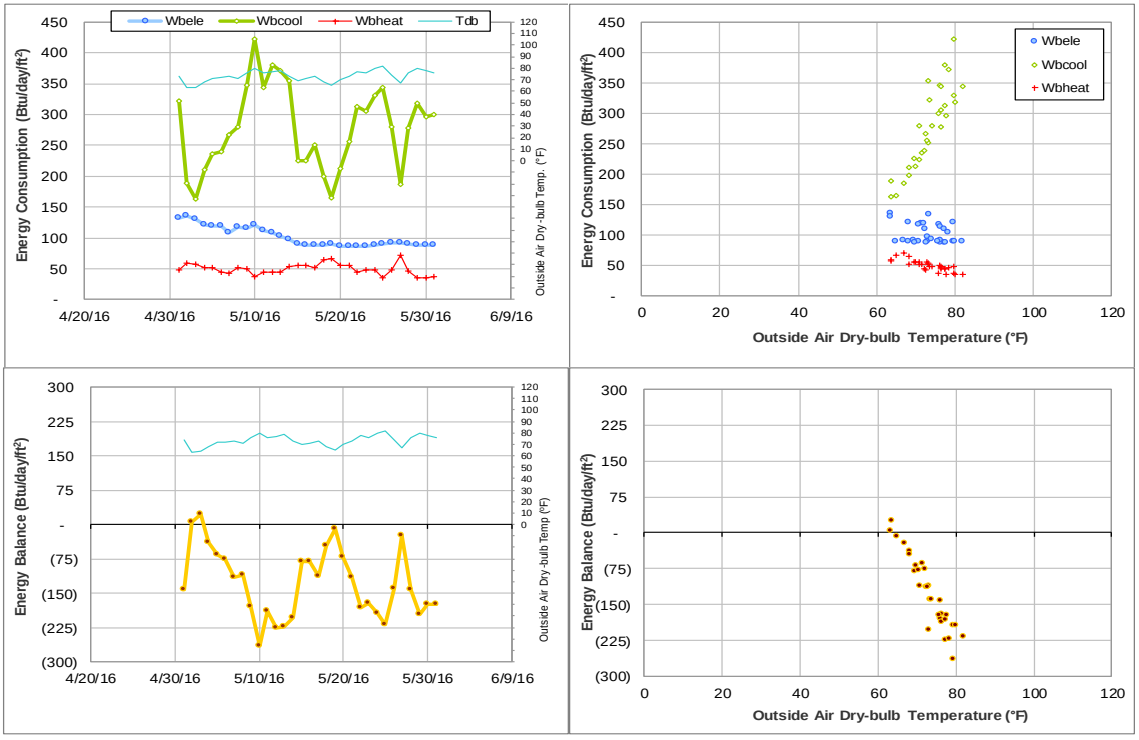


Figure IV-35 Leonard Hall - Dorm 7 and Ash LLC TAMU BLDG # 406-1403 Energy Balance Plot during May 2016

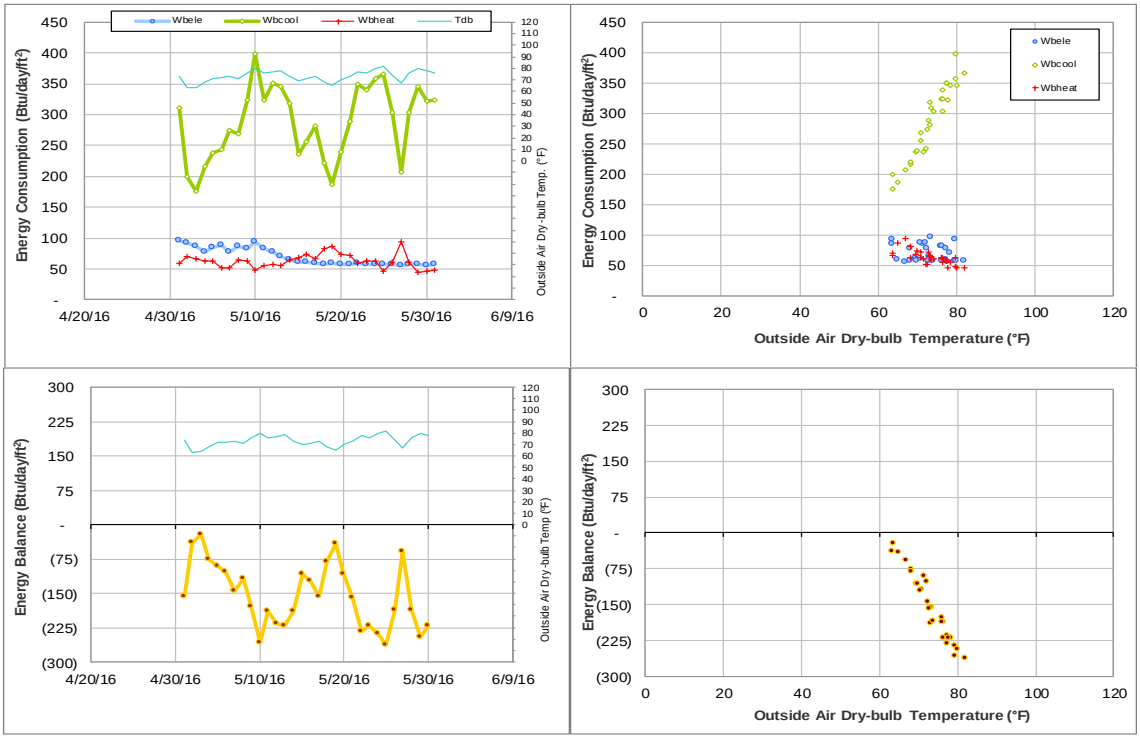


Figure IV-36 Leonard Hall - Dorm 7 TAMU BLDG # 406 Energy Balance Plot during May 2016

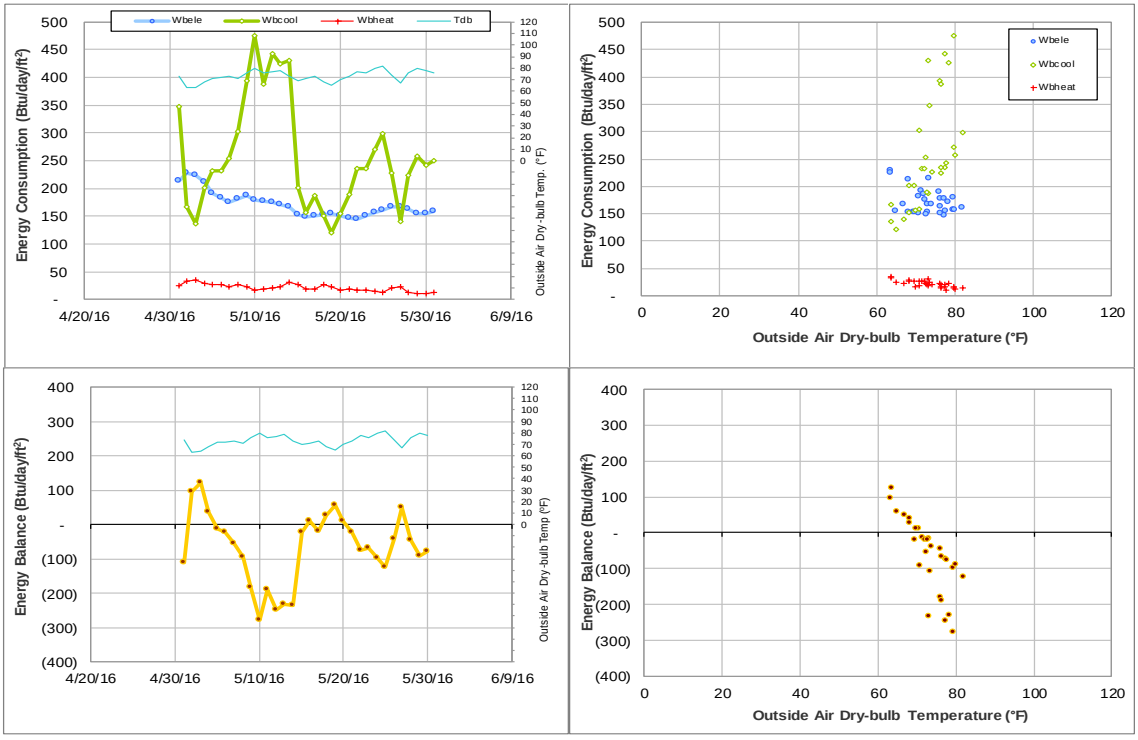


Figure IV-37 H. Grady Ash, Jr. '58 Leadership Learning Center TAMU BLDG # 1403 Energy Balance Plot during May 2016

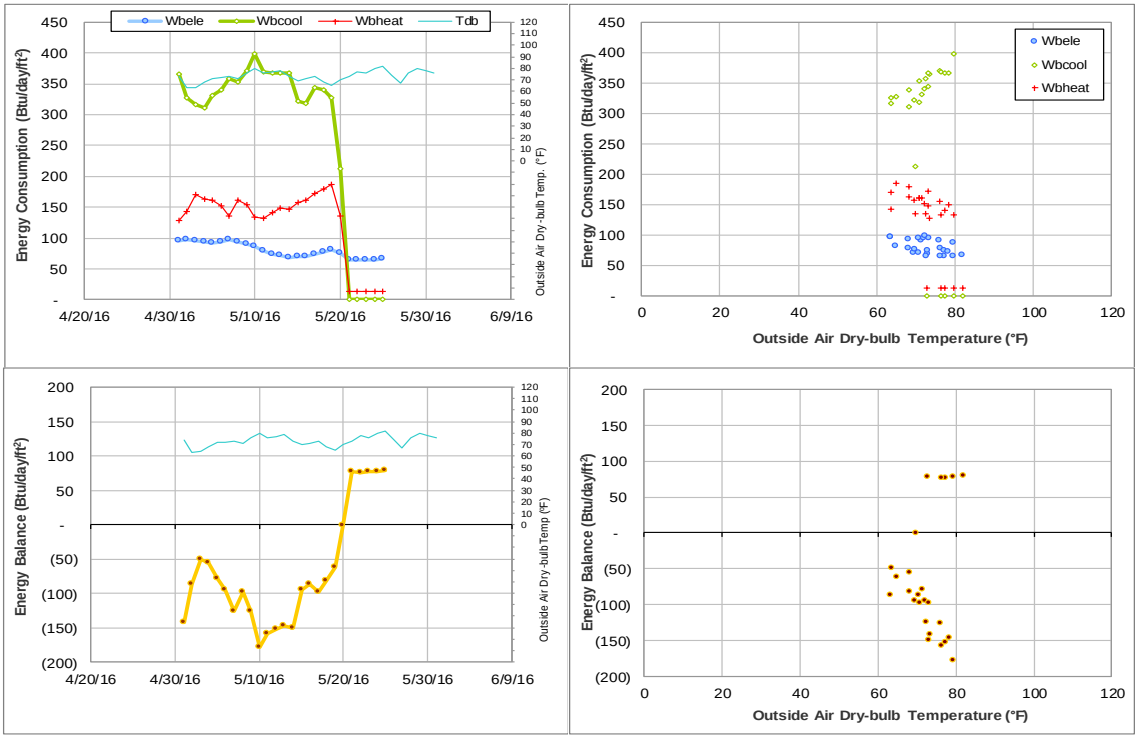


Figure IV-38 Whitely Hall - Dorm 9 TAMU BLDG # 408 Energy Balance Plot during May 2016

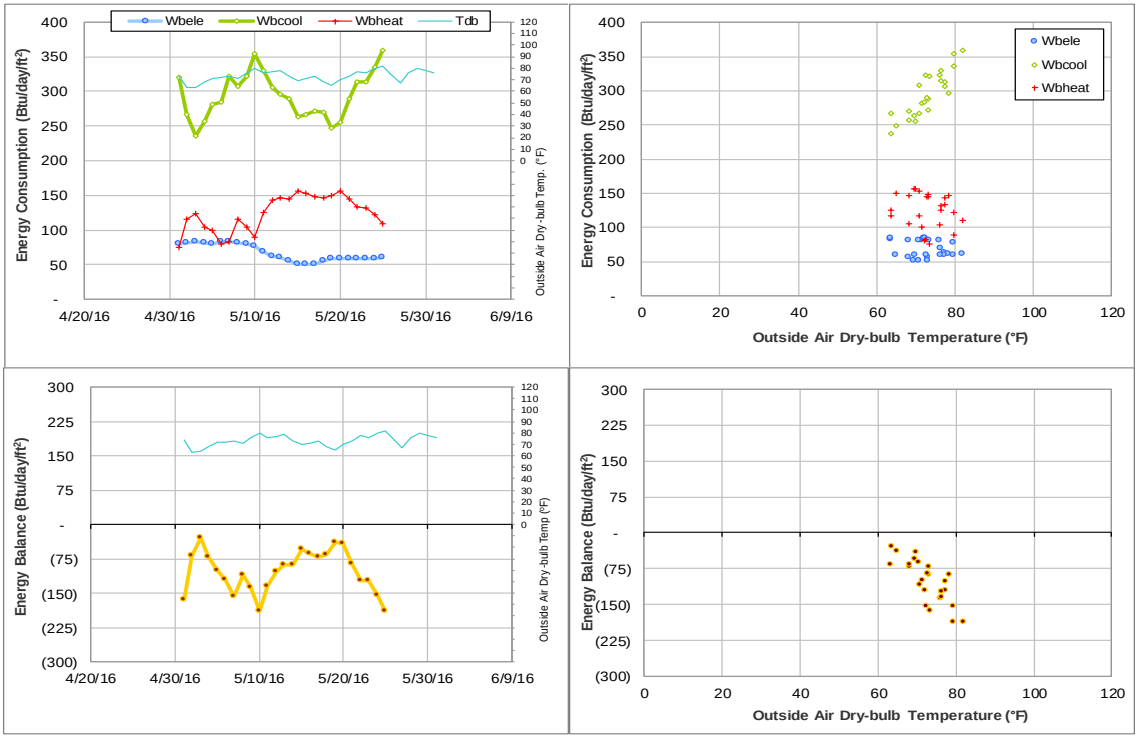


Figure IV-39 White Hall - Dorm 10 TAMU BLDG # 409 Energy Balance Plot during May 2016

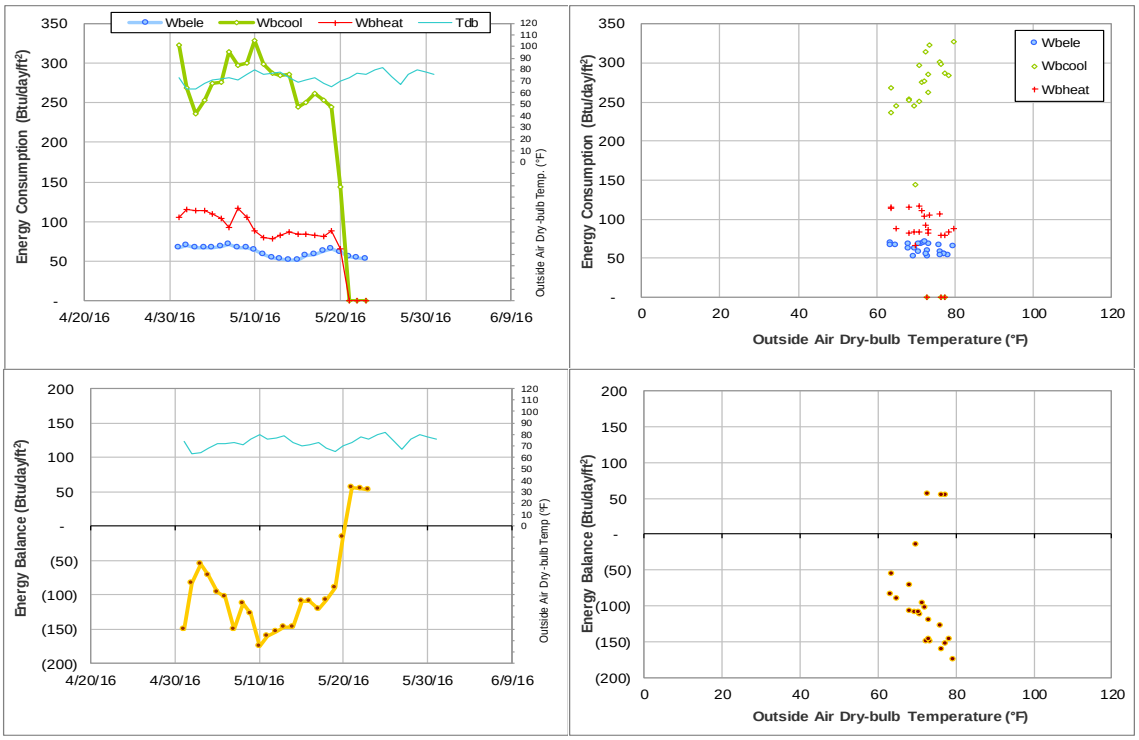


Figure IV-40 Harrington Hall - Dorm 11 TAMU BLDG # 410 Energy Balance Plot during May 2016

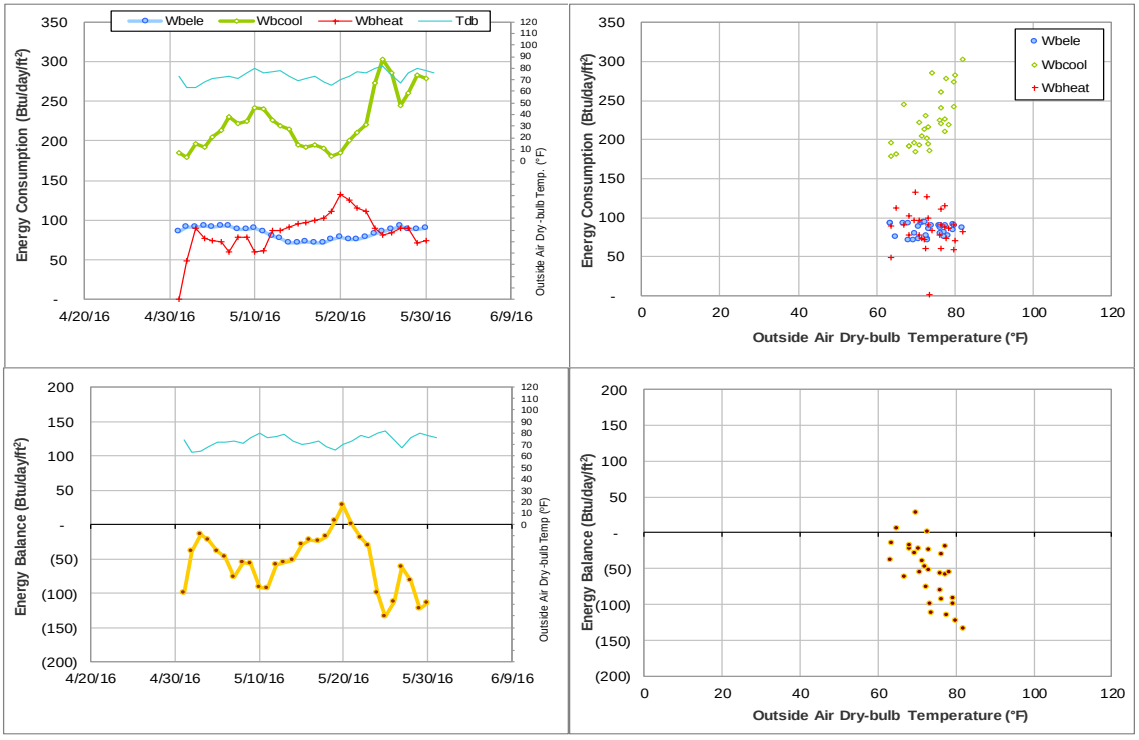


Figure IV-41 Utay Hall - Dorm 12 TAMU BLDG # 411 Energy Balance Plot during May 2016

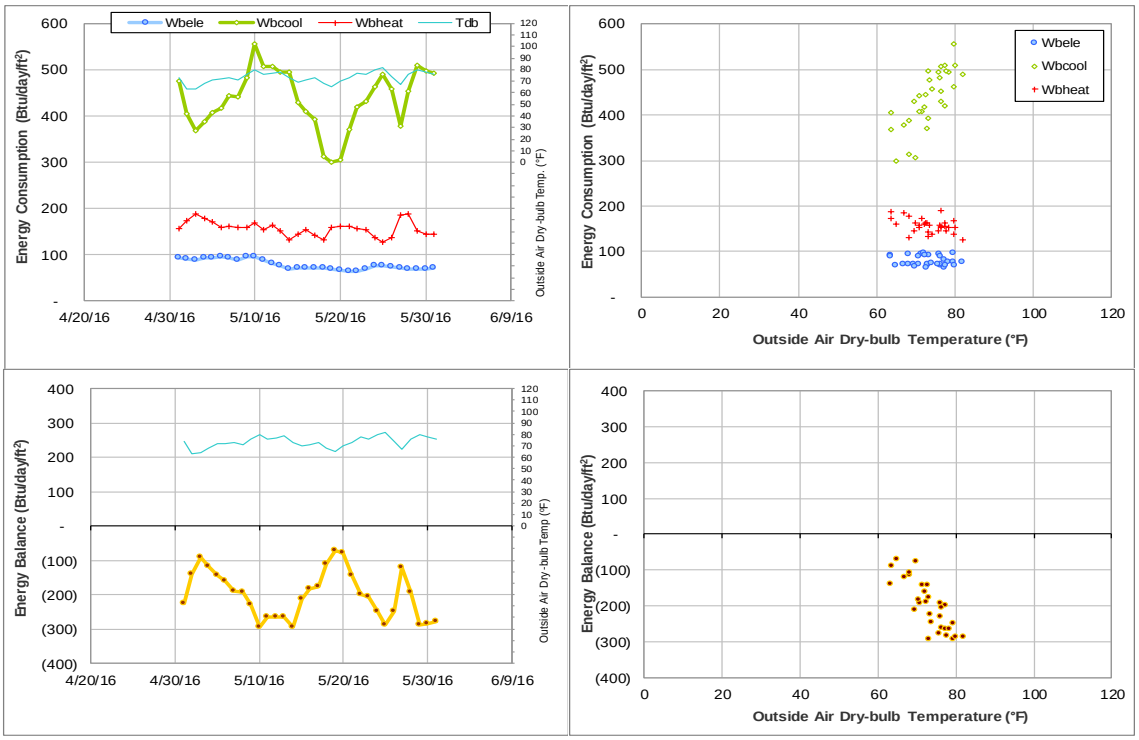


Figure IV-42 Moses Residence Hall TAMU BLDG # 412 Energy Balance Plot during May 2016

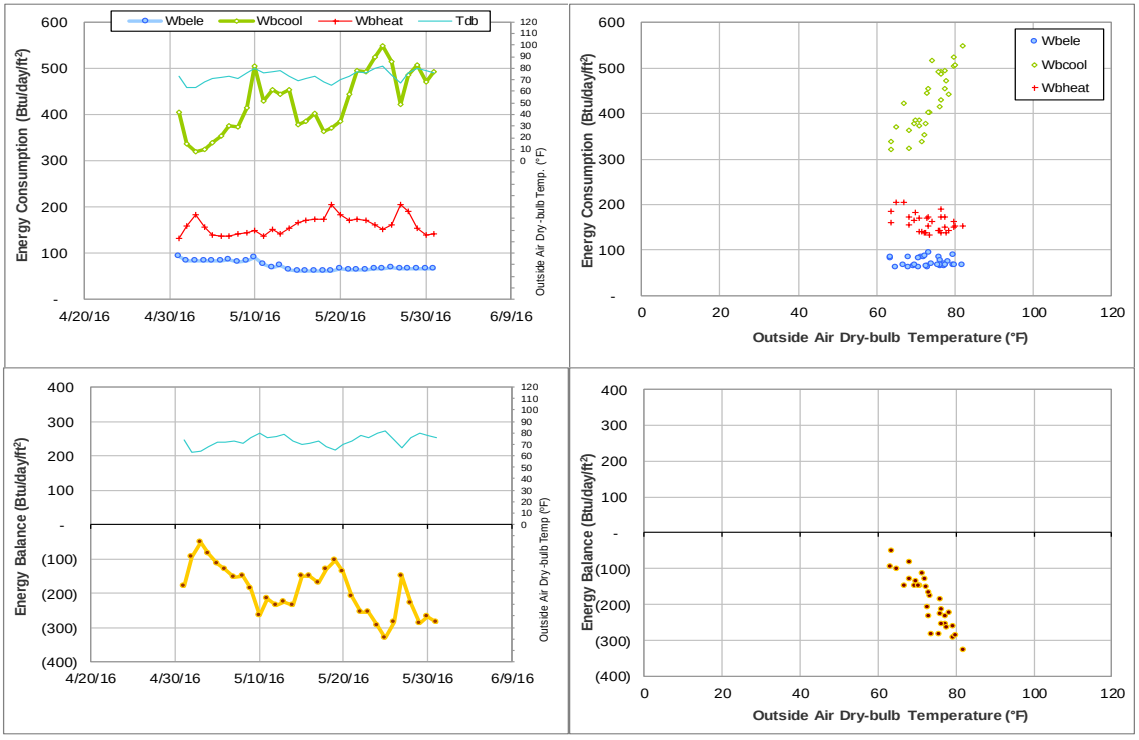


Figure IV-43 Davis-Gary Residence Hall TAMU BLDG # 415 Energy Balance Plot during May 2016

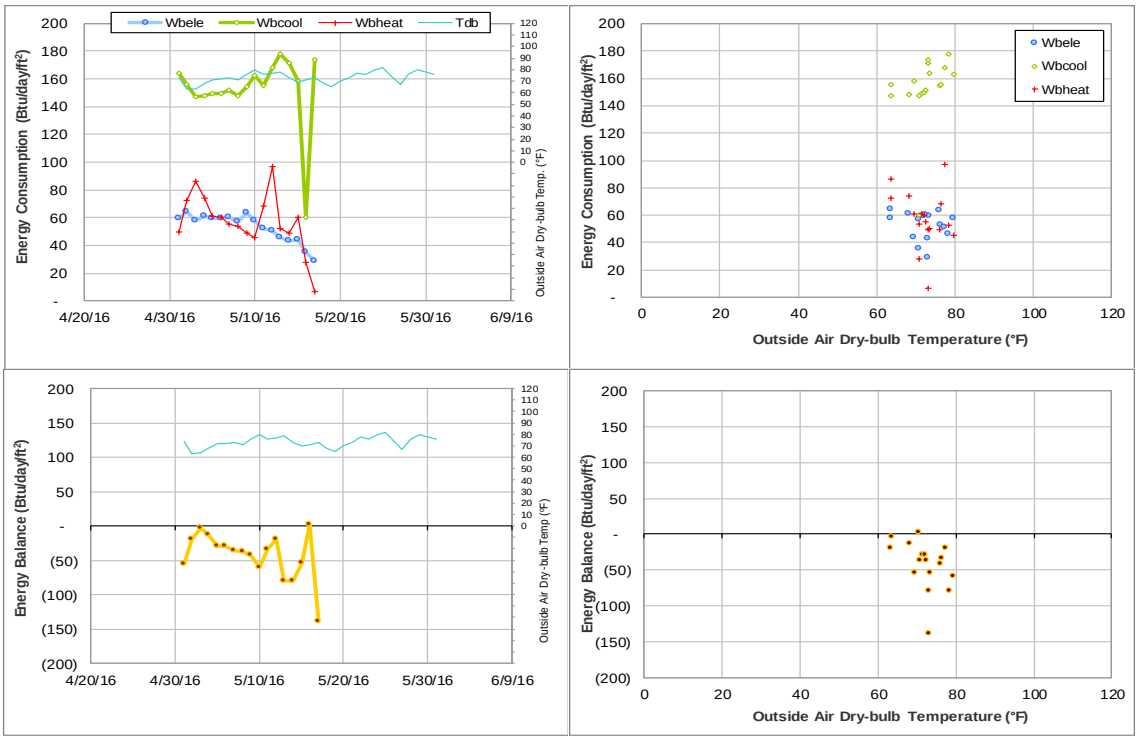


Figure IV-44 Legett Residence Hall TAMU BLDG # 419 Energy Balance Plot during May 2016

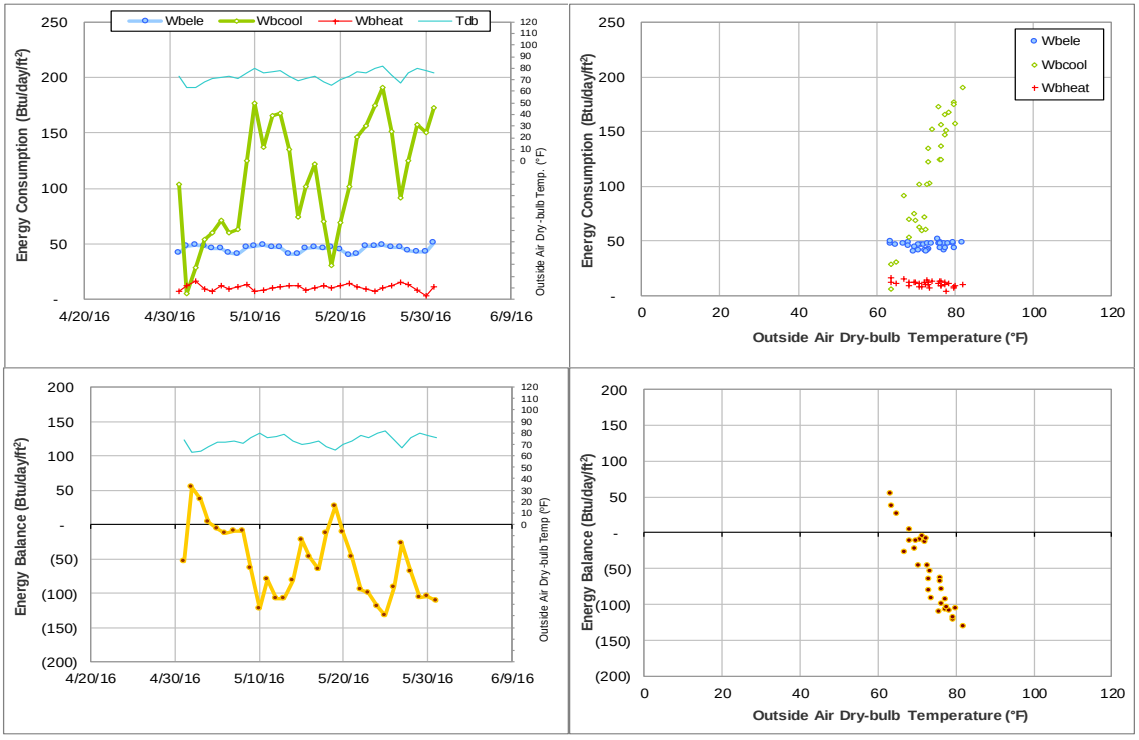


Figure IV-45 Milner Hall TAMU BLDG # 420 Energy Balance Plot during May 2016

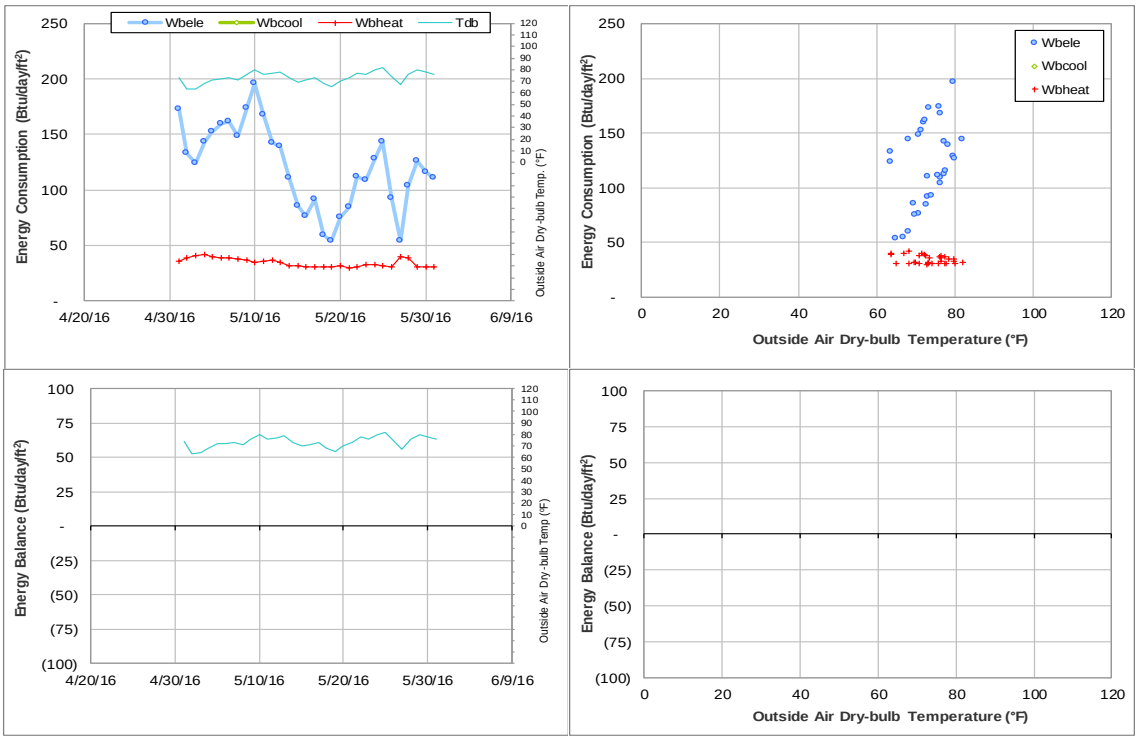


Figure IV-46 Walton Residence Hall TAMU BLDG # 422 Energy Balance Plot during May 2016

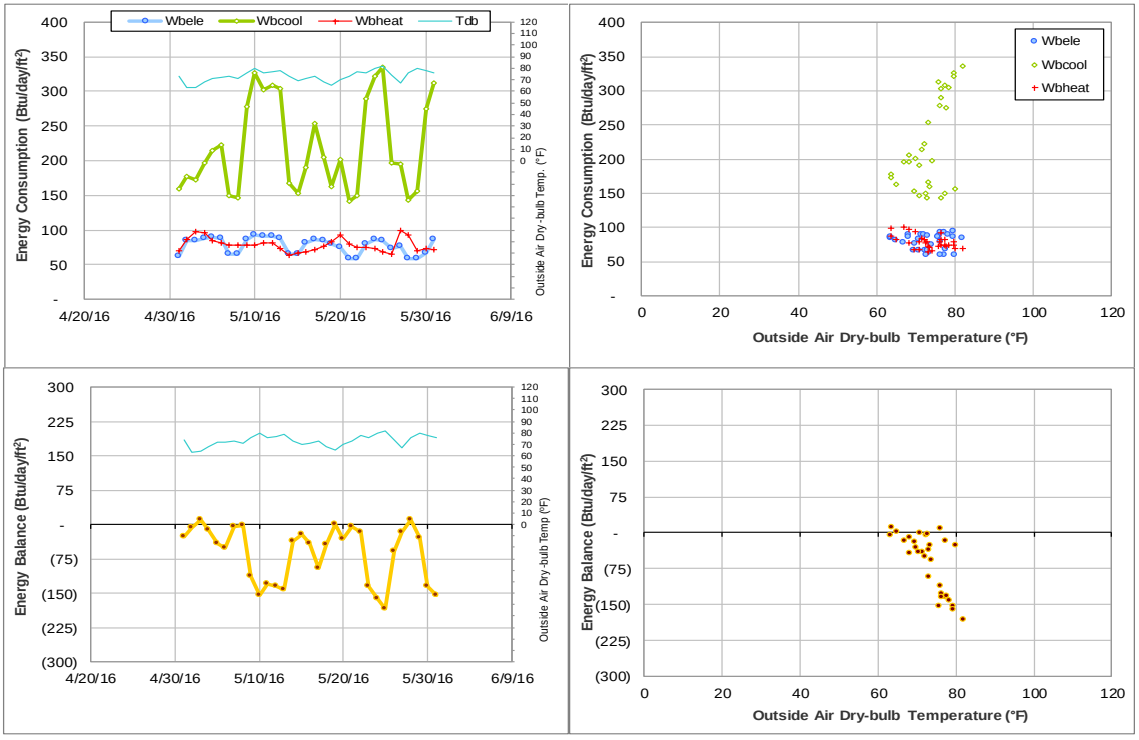


Figure IV-47 Hotard Hall TAMU BLDG # 424 Energy Balance Plot during May 2016

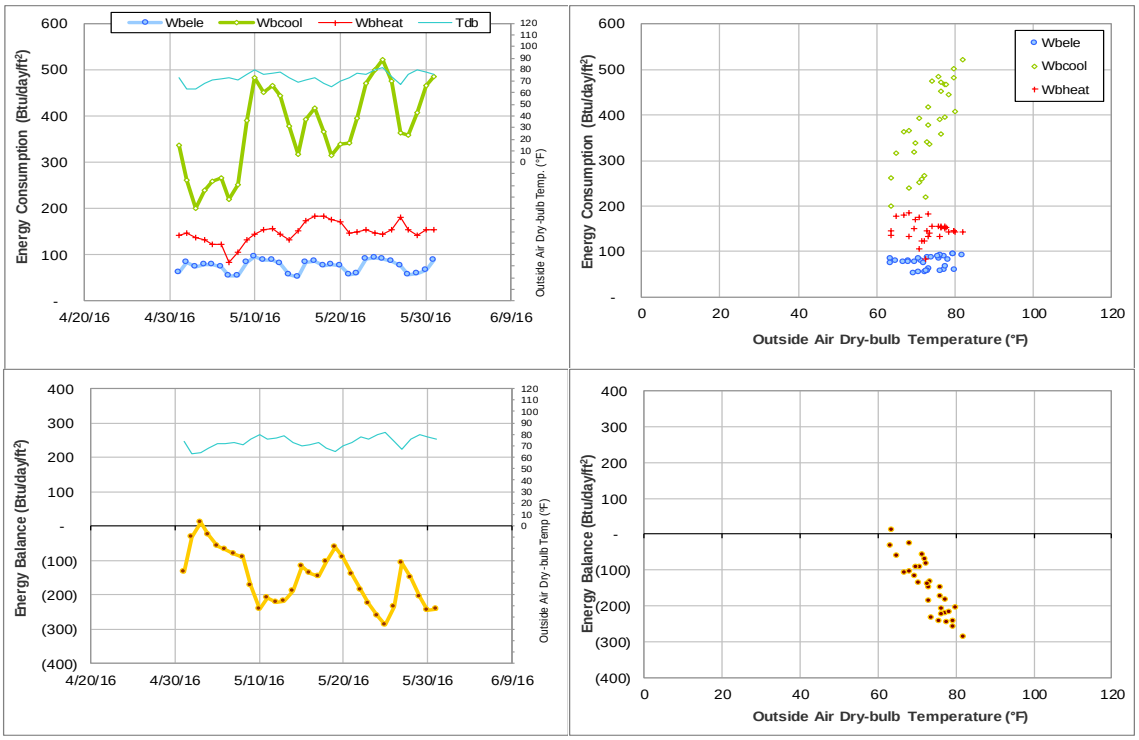


Figure IV-48 Henderson Hall TAMU BLDG # 425 Energy Balance Plot during May 2016

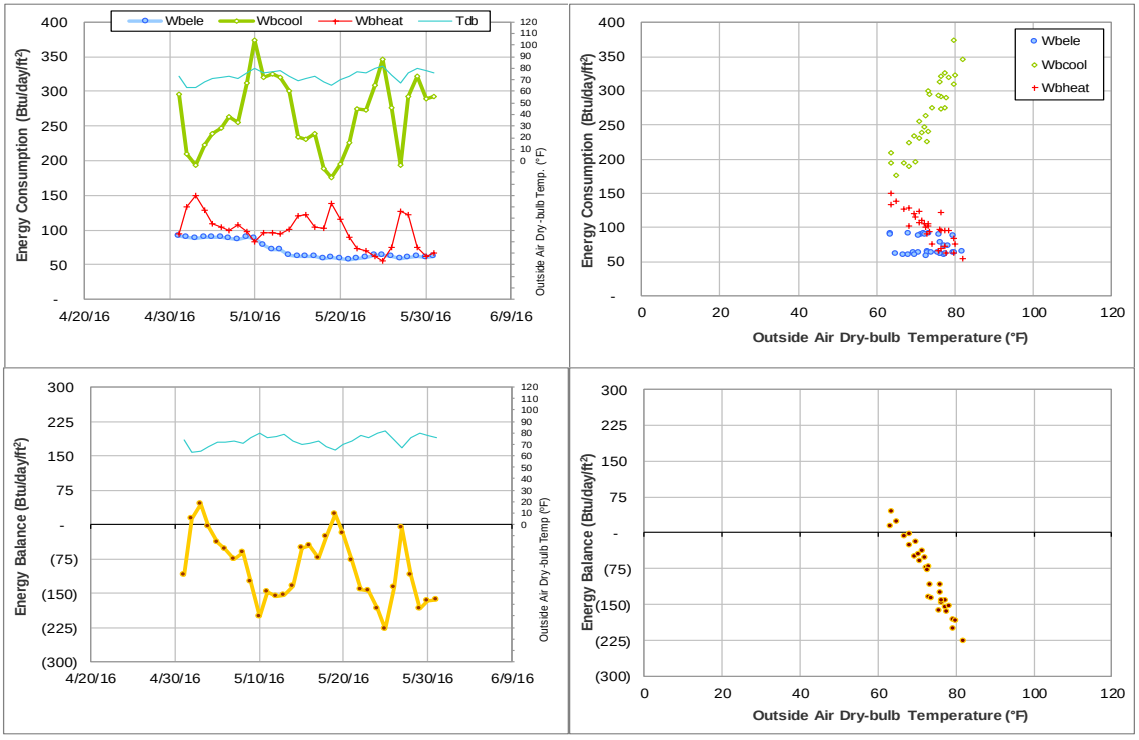


Figure IV-49 FHK Complex TAMU BLDG # 426 Energy Balance Plot during May 2016

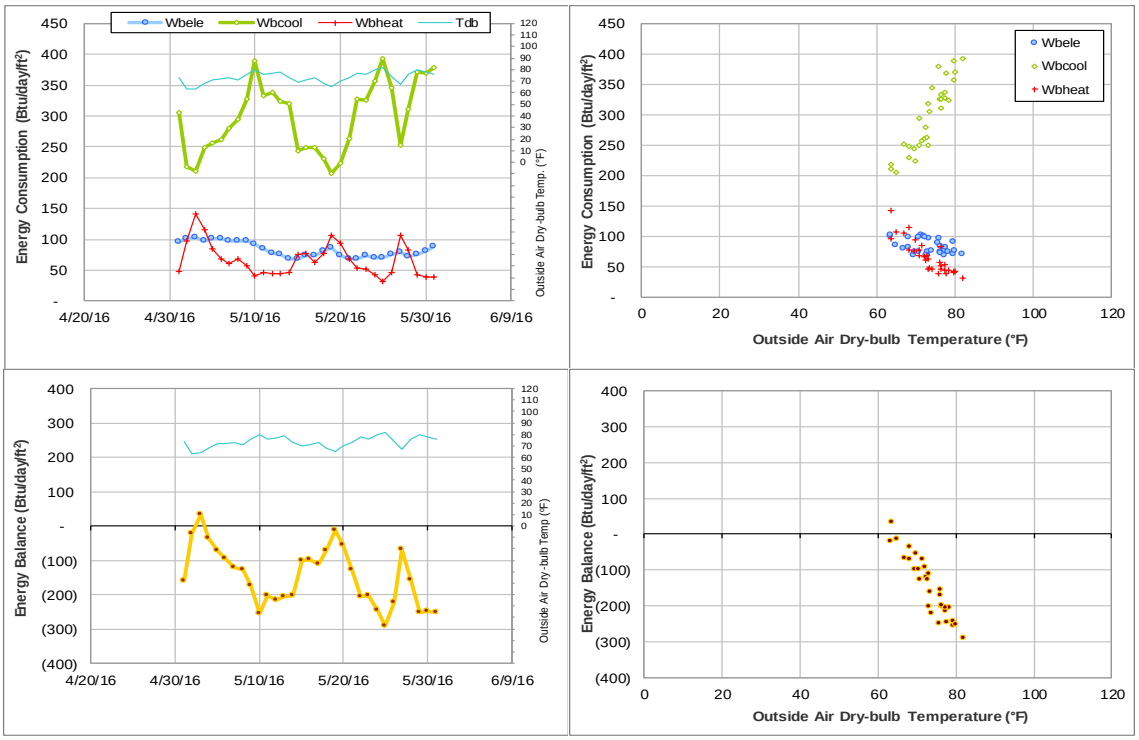


Figure IV-50 Schumacher Residence Hall TAMU BLDG # 430 Energy Balance Plot during May 2016

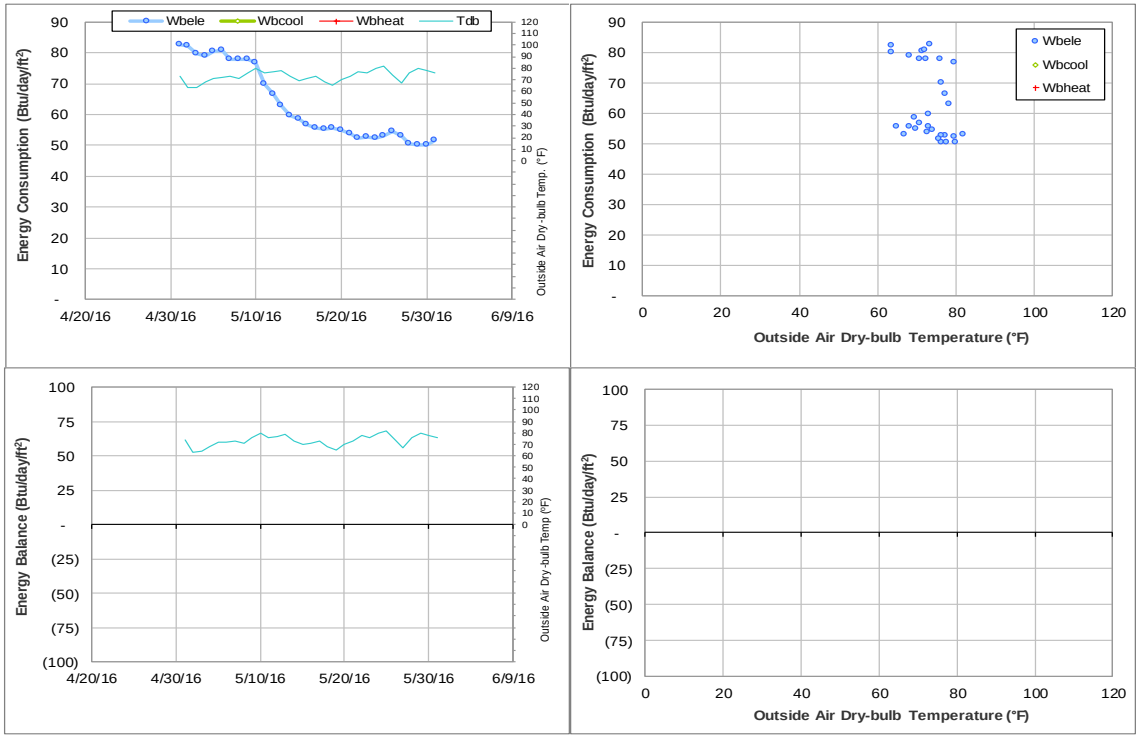


Figure IV-51 Mosher Commons Krueger Dunn Aston TAMU BLDG # 433-447 Energy Balance Plot during May 2016

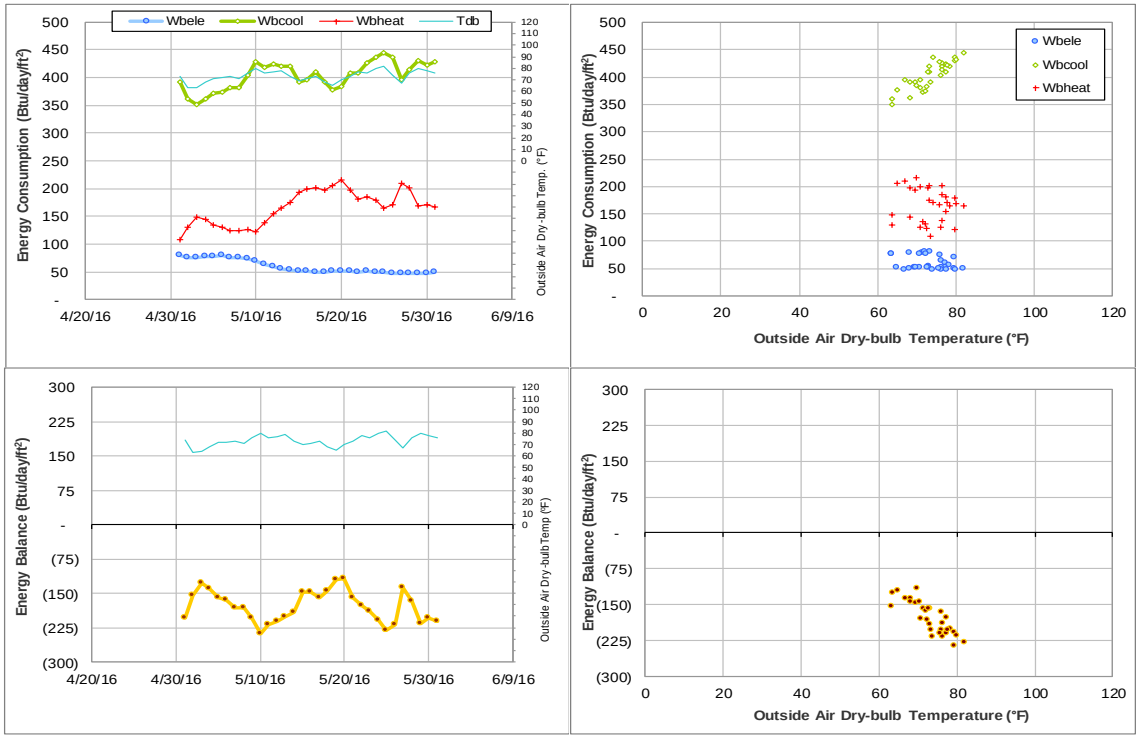


Figure IV-52 Mosher Residence Hall TAMU BLDG # 433 Energy Balance Plot during May 2016

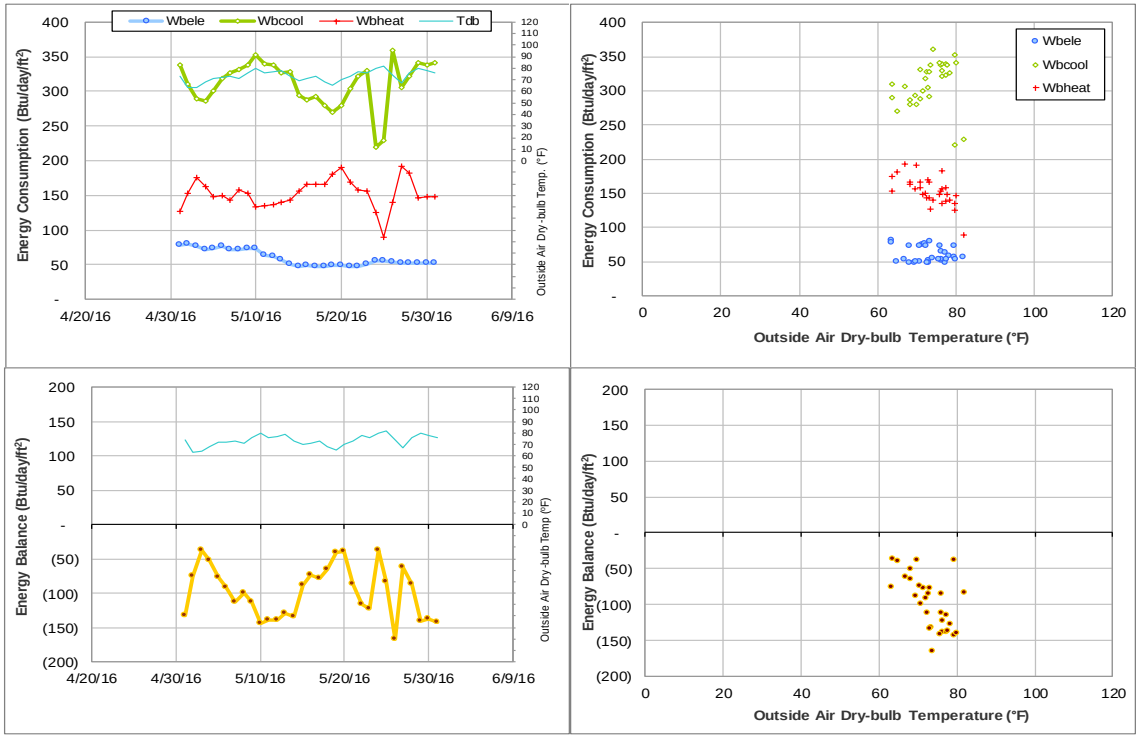


Figure IV-53 Aston Residence Hall TAMU BLDG # 447 Energy Balance Plot during May 2016

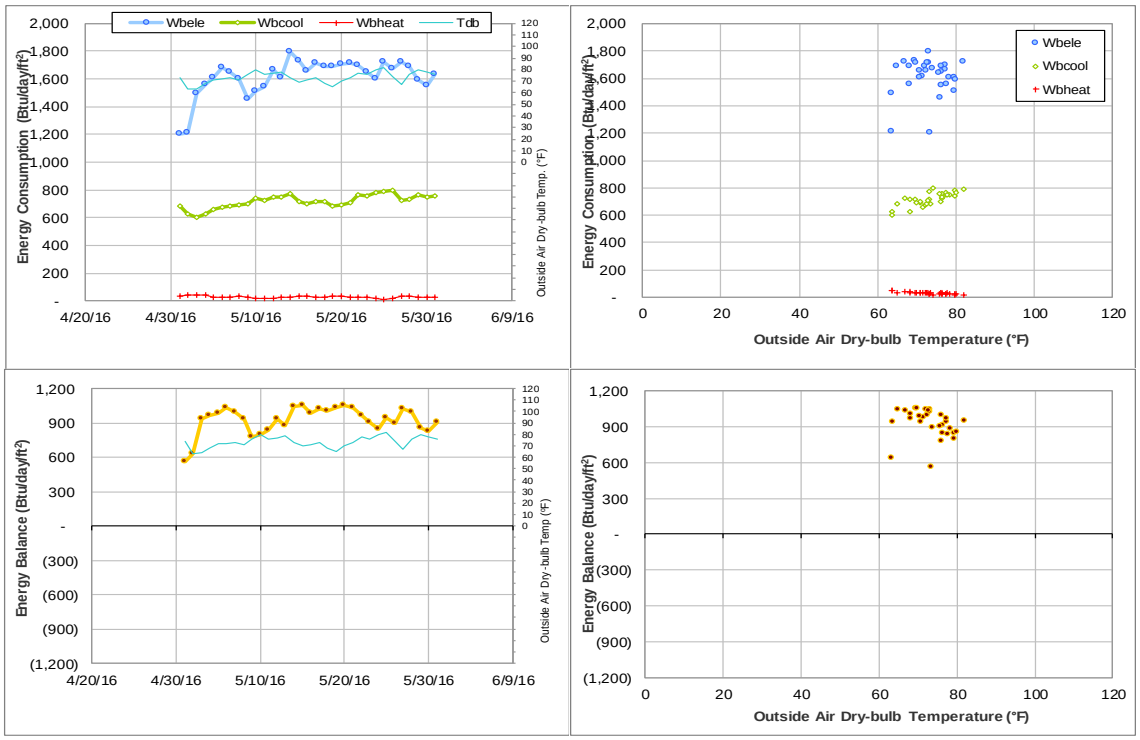


Figure IV-54 Luedecke Building (Cyclotron) TAMU BLDG # 434 Energy Balance Plot during May 2016

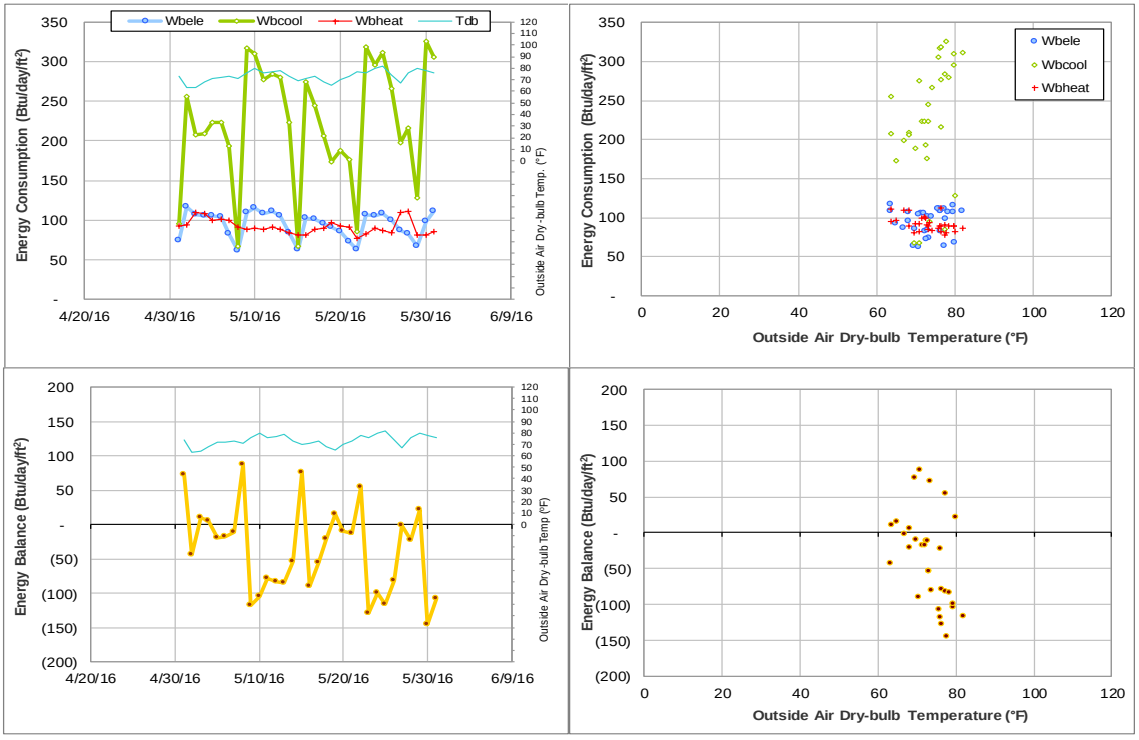


Figure IV-55 Harrington Education Center Office Tower TAMU BLDG # 435 Energy Balance Plot during May 2016

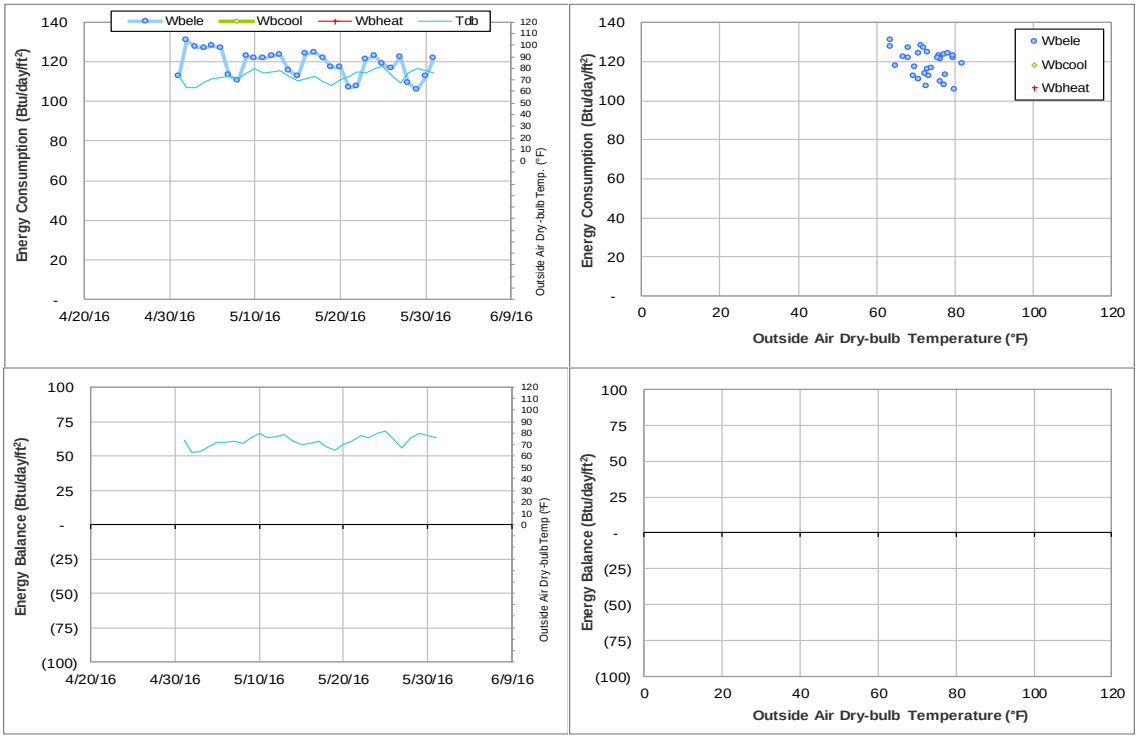


Figure IV-56 Reed-McDonald and Engineering Innovation Center TAMU BLDG # 436-499 Energy Balance Plot during May 2016

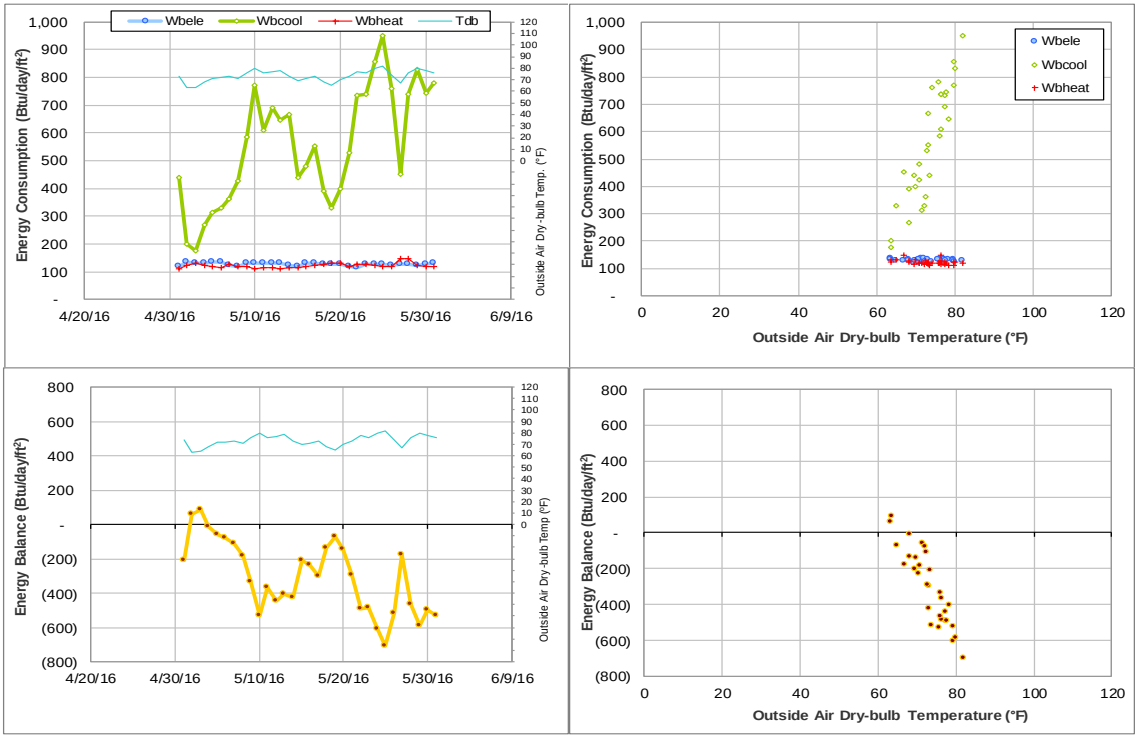


Figure IV-57 Reed-McDonald Building TAMU BLDG # 436 Energy Balance Plot during May 2016

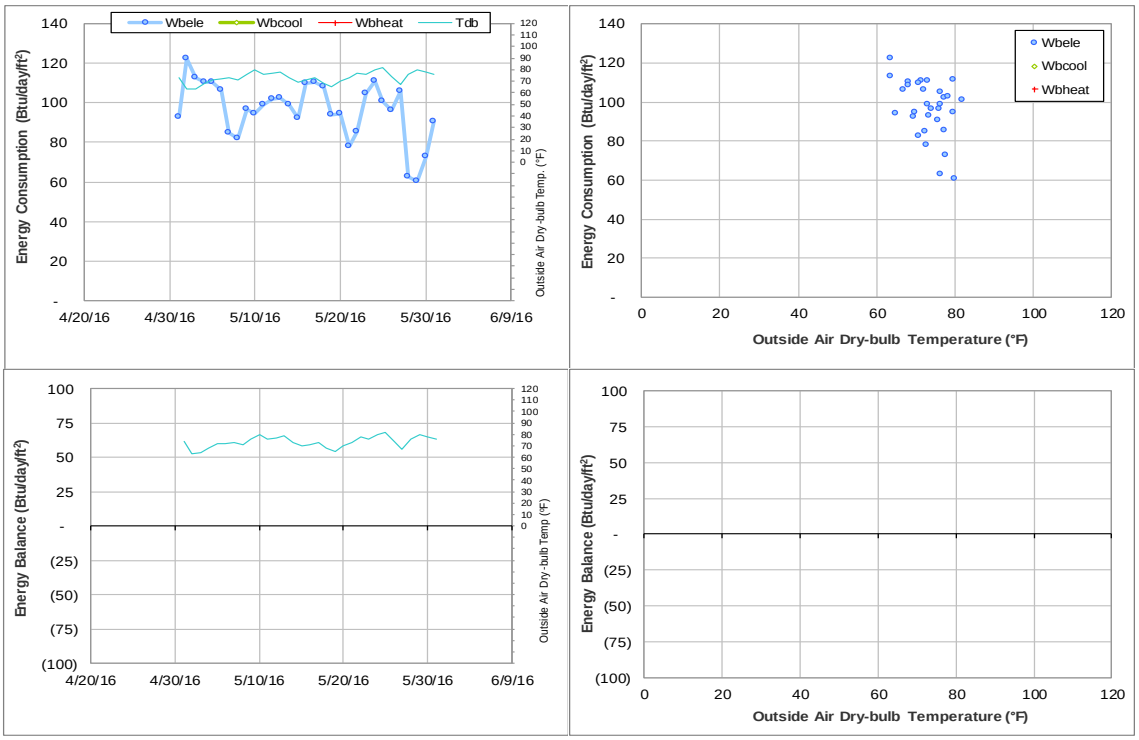


Figure IV-58 Engineering Innovation Center TAMU BLDG # 499 Energy Balance Plot during May 2016

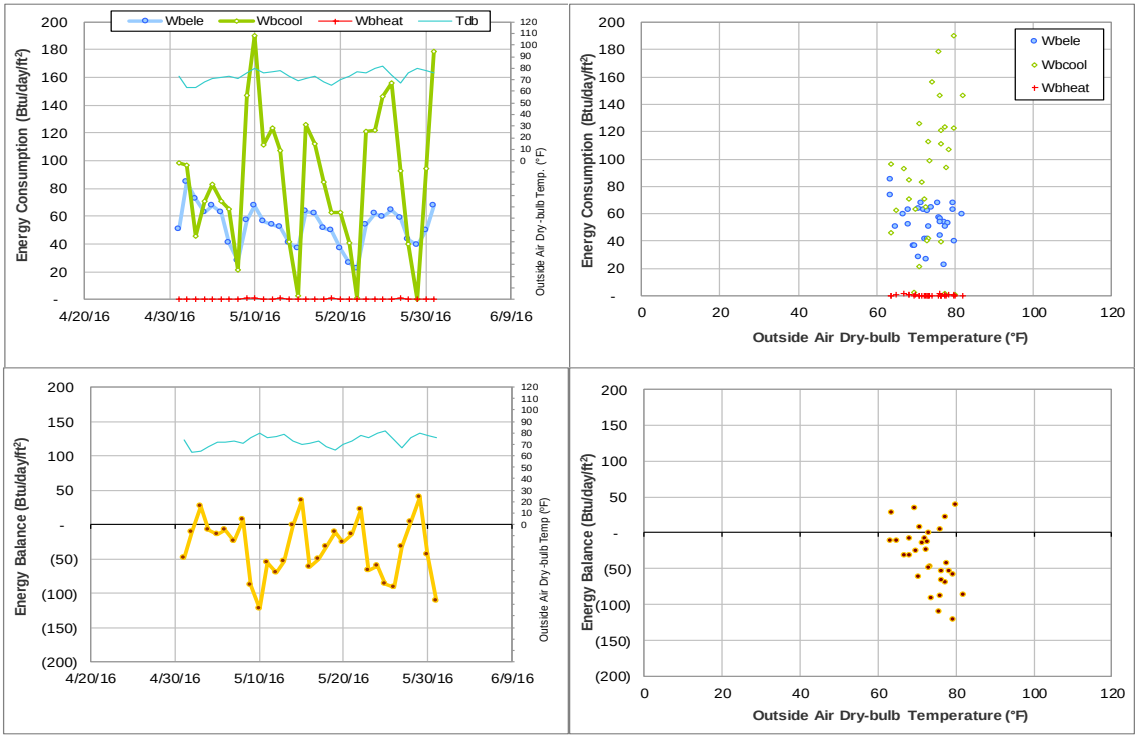


Figure IV-59 Harrington Education Center Classroom Building TAMU BLDG # 438 Energy Balance Plot during May 2016

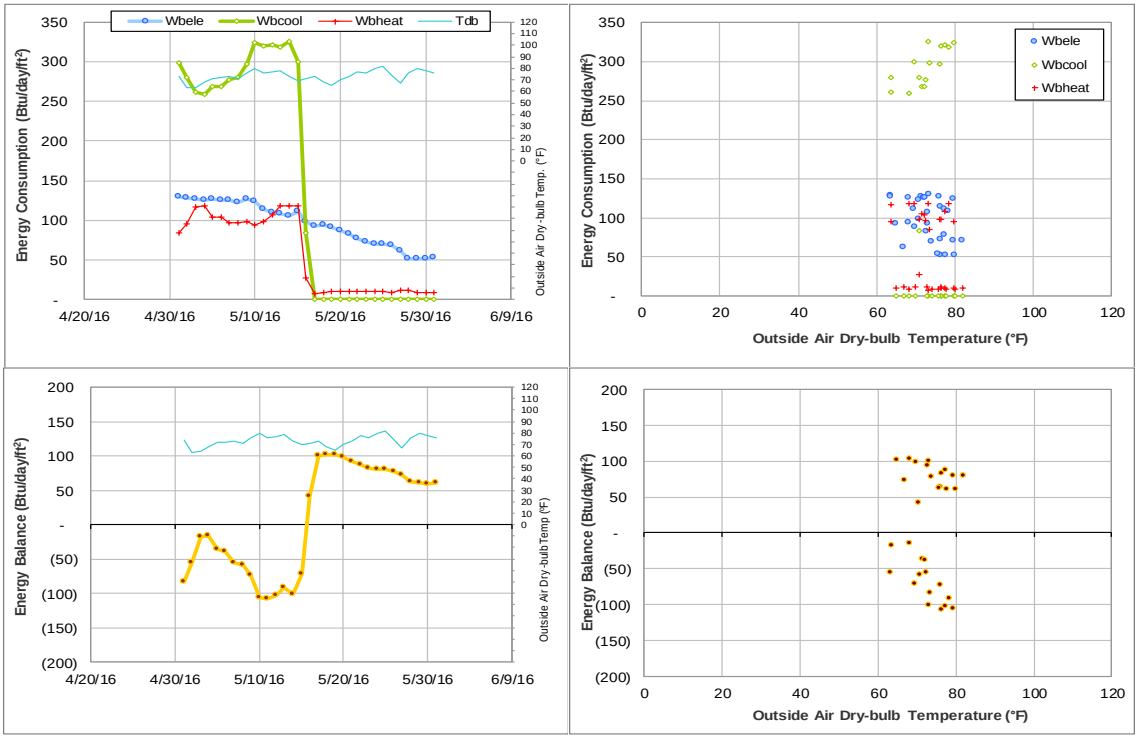


Figure IV-60 Krueger Residence Hall TAMU BLDG # 441 Energy Balance Plot during May 2016

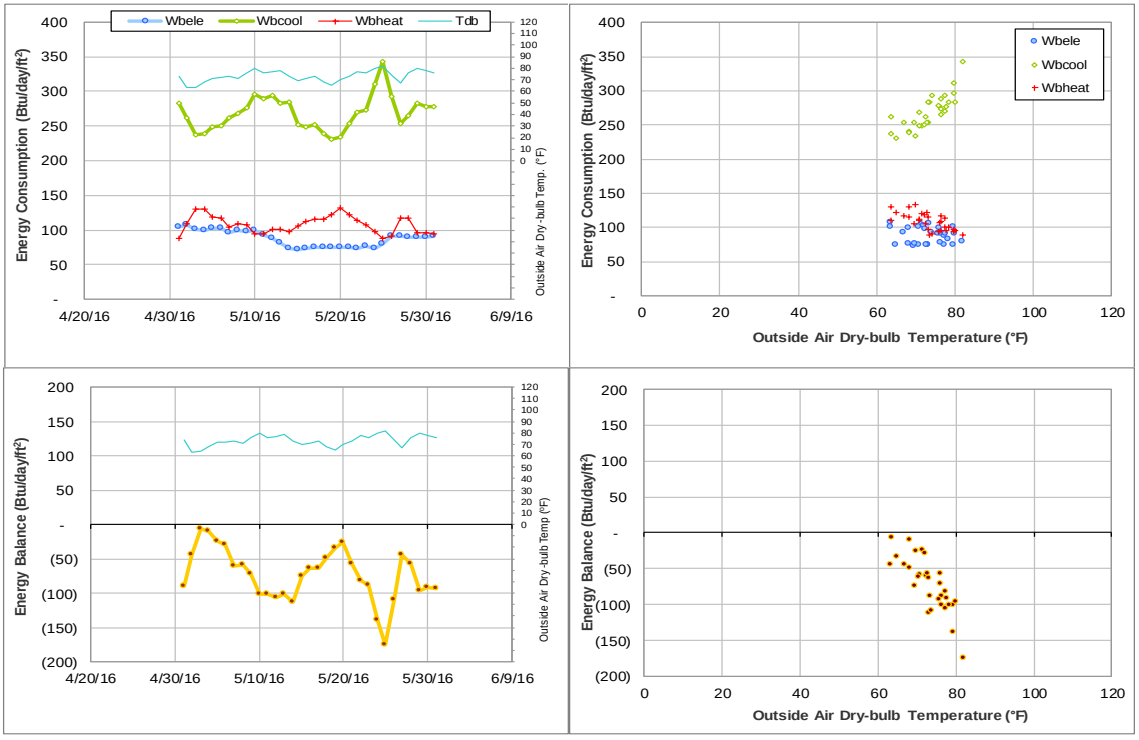


Figure IV-61 Dunn Residence Hall TAMU BLDG # 442 Energy Balance Plot during May 2016

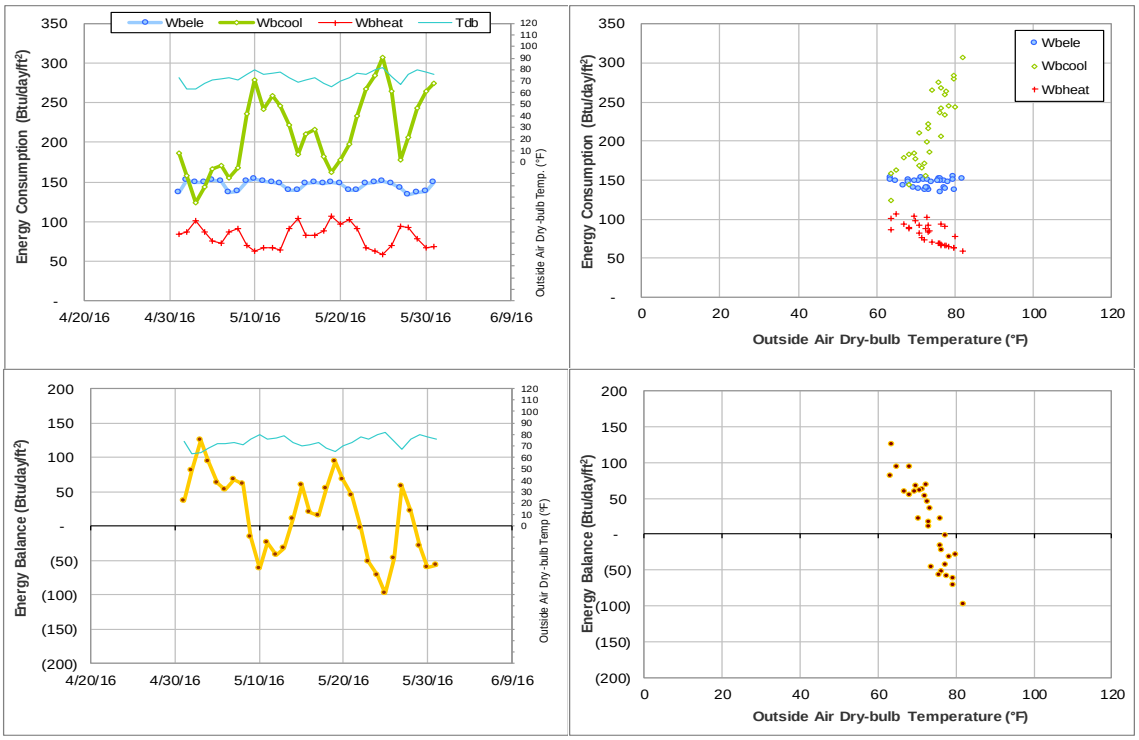


Figure IV-62 Oceanography & Meteorology Building TAMU BLDG # 443 Energy Balance Plot during May 2016

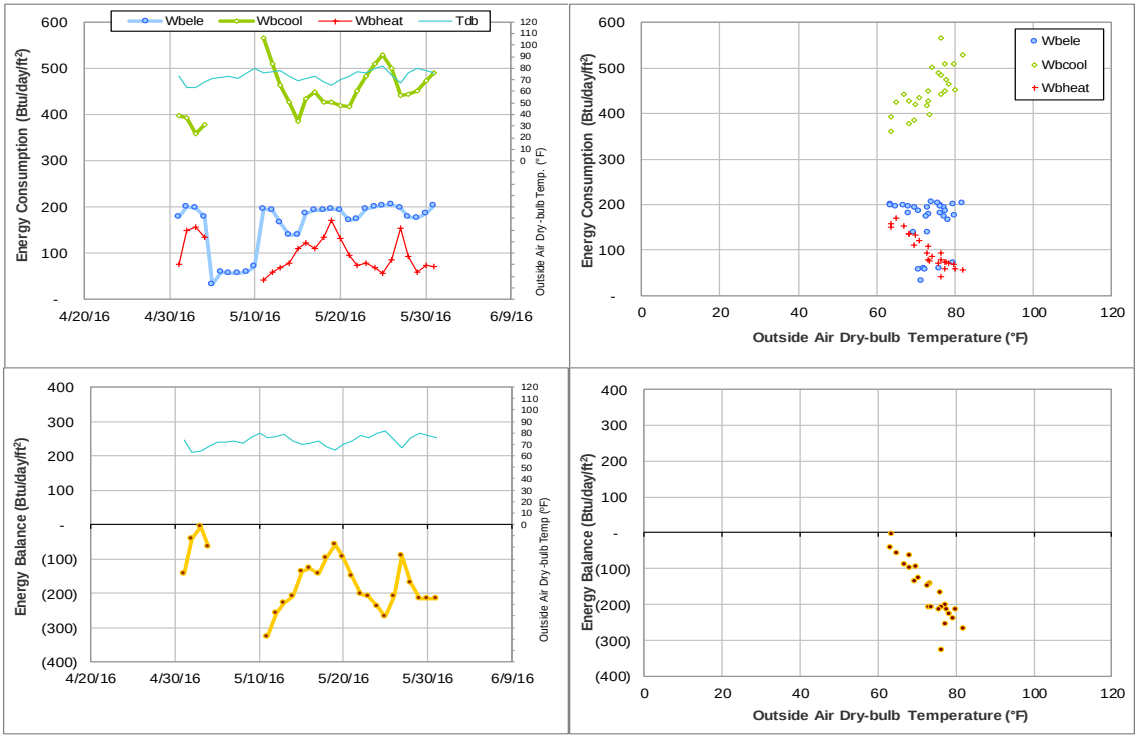


Figure IV-63 Peterson Building TAMU BLDG # 444 Energy Balance Plot during May 2016

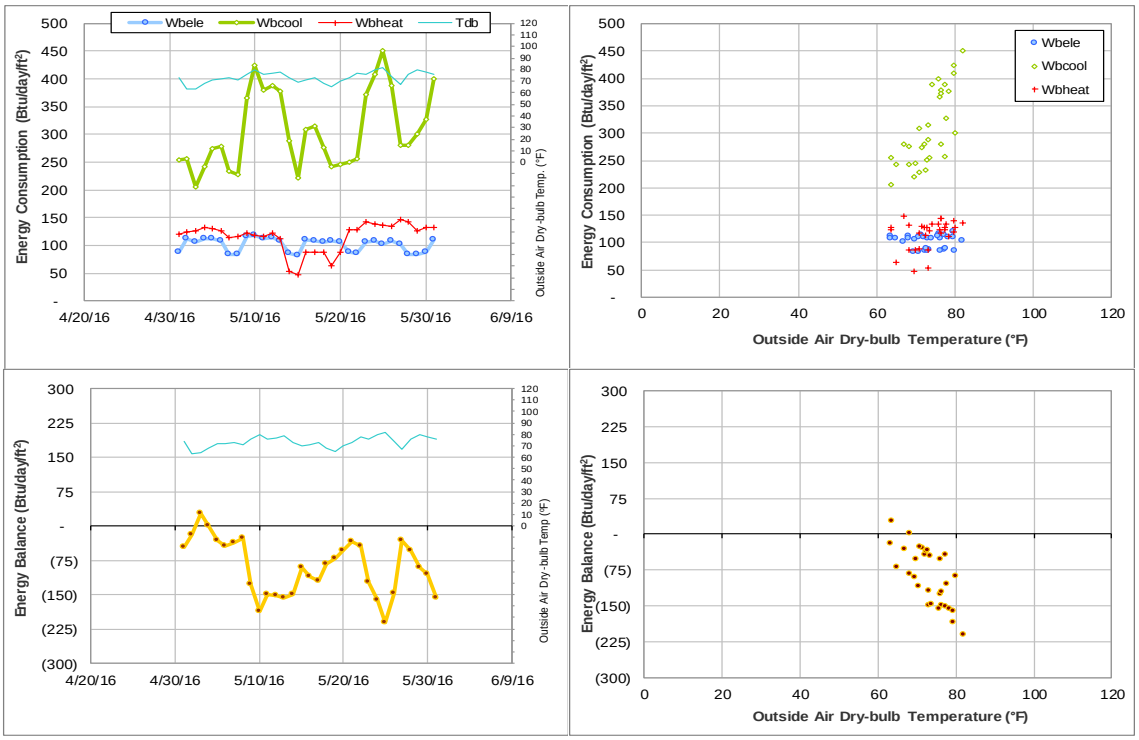


Figure IV-64 Teague Research Center and DPC Annex TAMU BLDG # 445-517 Energy Balance Plot during May 2016

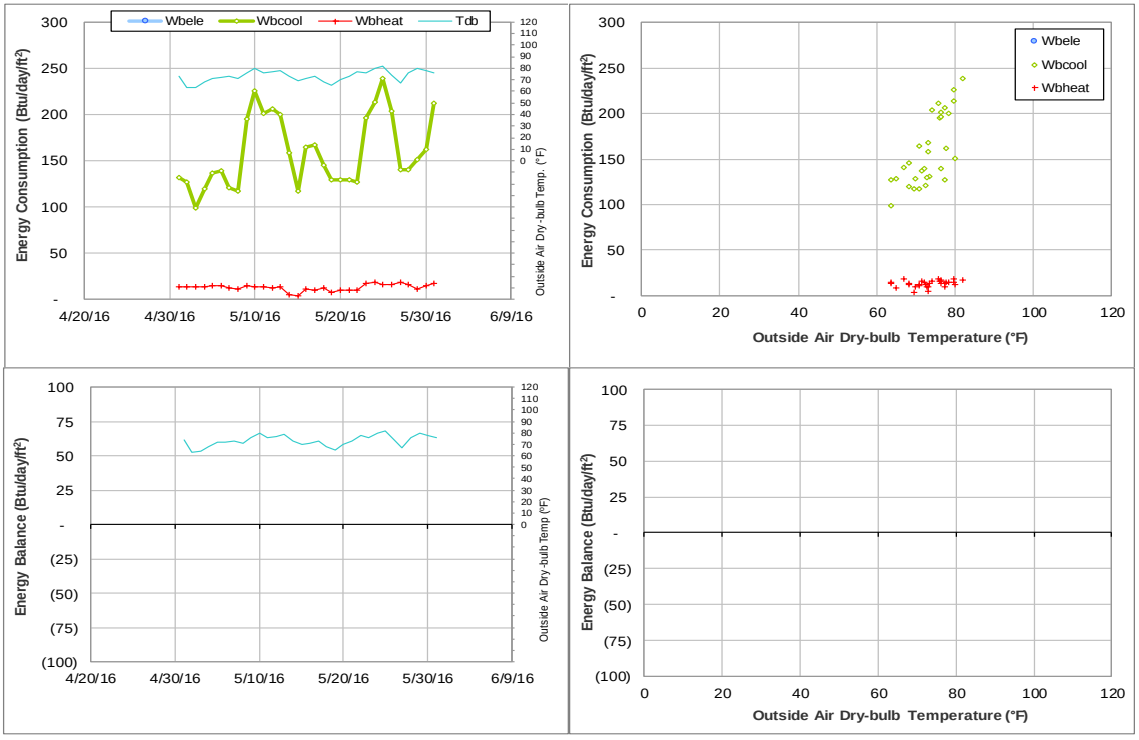


Figure IV-65 Teague Research Center TAMU BLDG # 445 Energy Balance Plot during May 2016

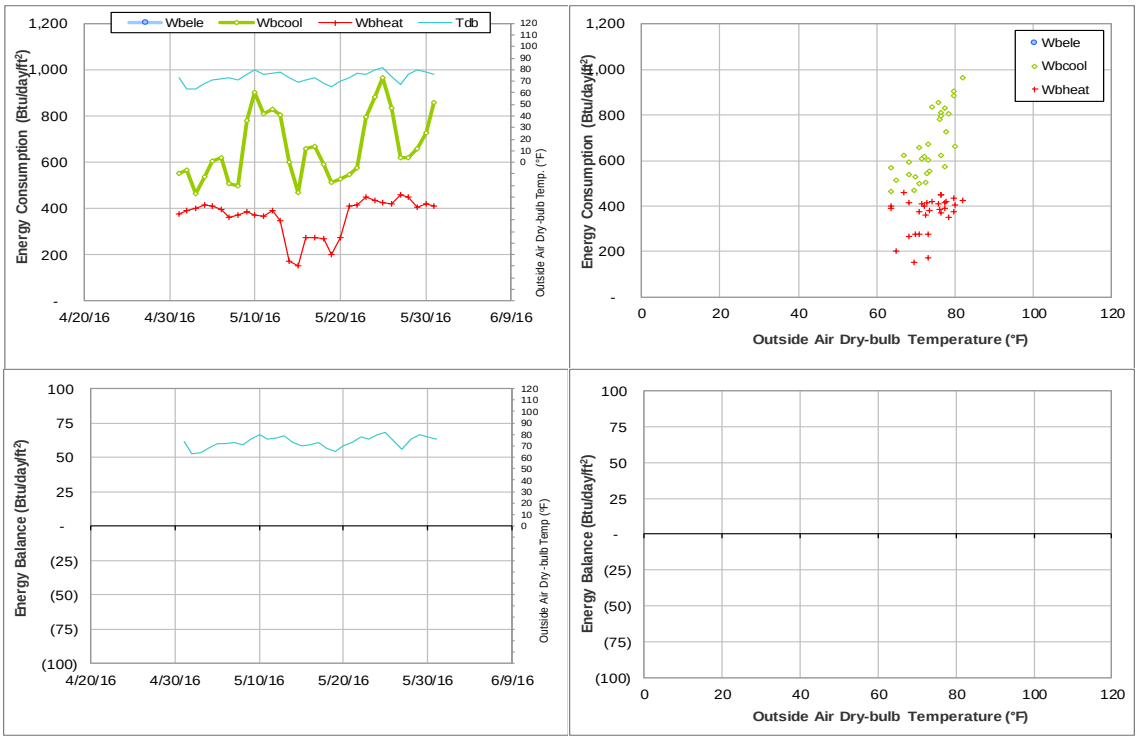


Figure IV-66 DPC Annex TAMU BLDG # 517 Energy Balance Plot during May 2016

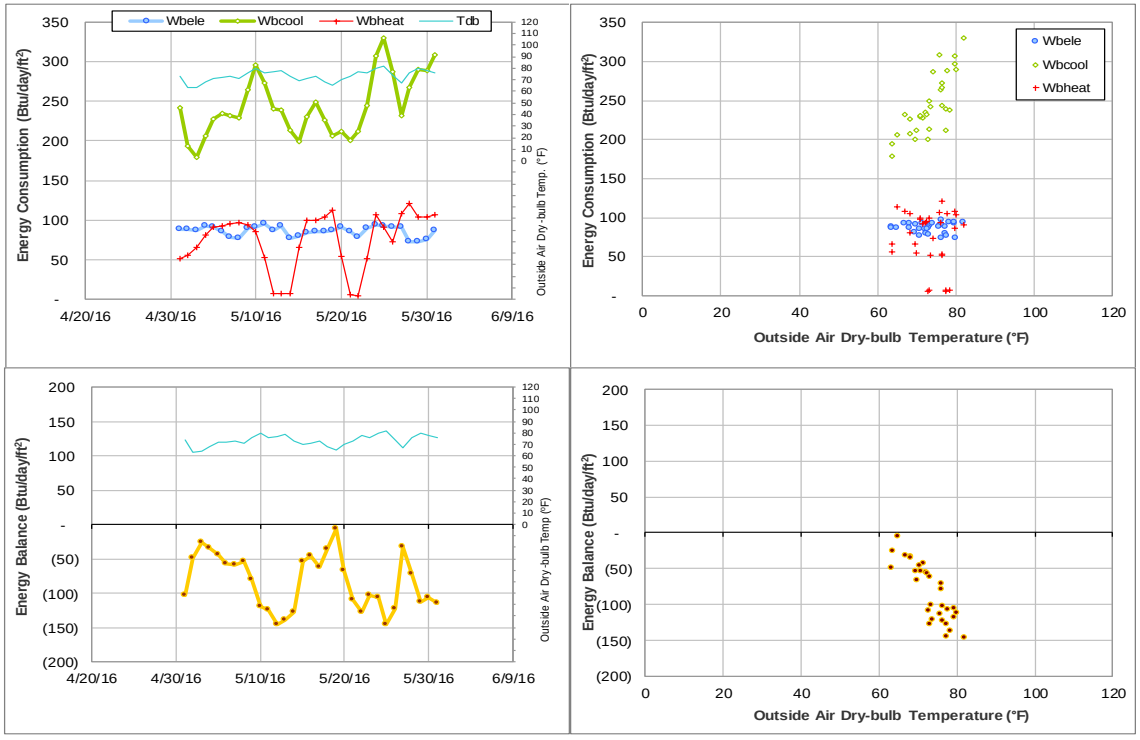


Figure IV-67 Rudder Tower and Theatre Complex TAMU BLDG # 446 Energy Balance Plot during May 2016

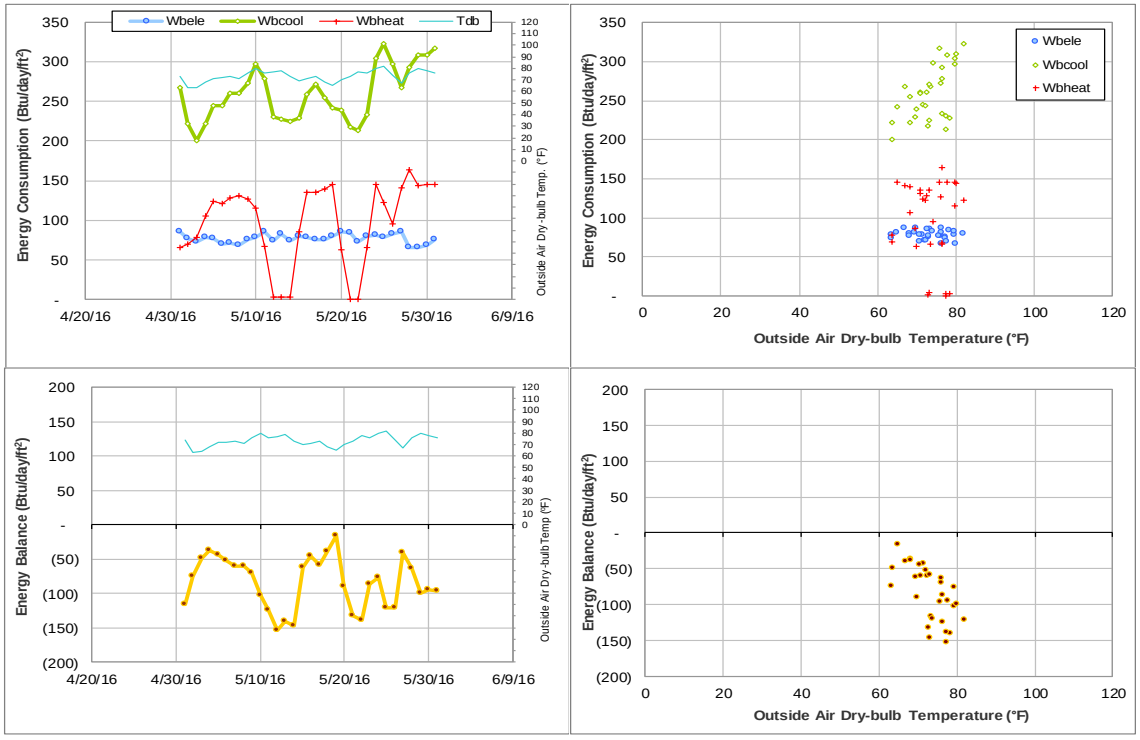


Figure IV-68 Rudder Theatre Complex TAMU BLDG # 446 Energy Balance Plot during May 2016

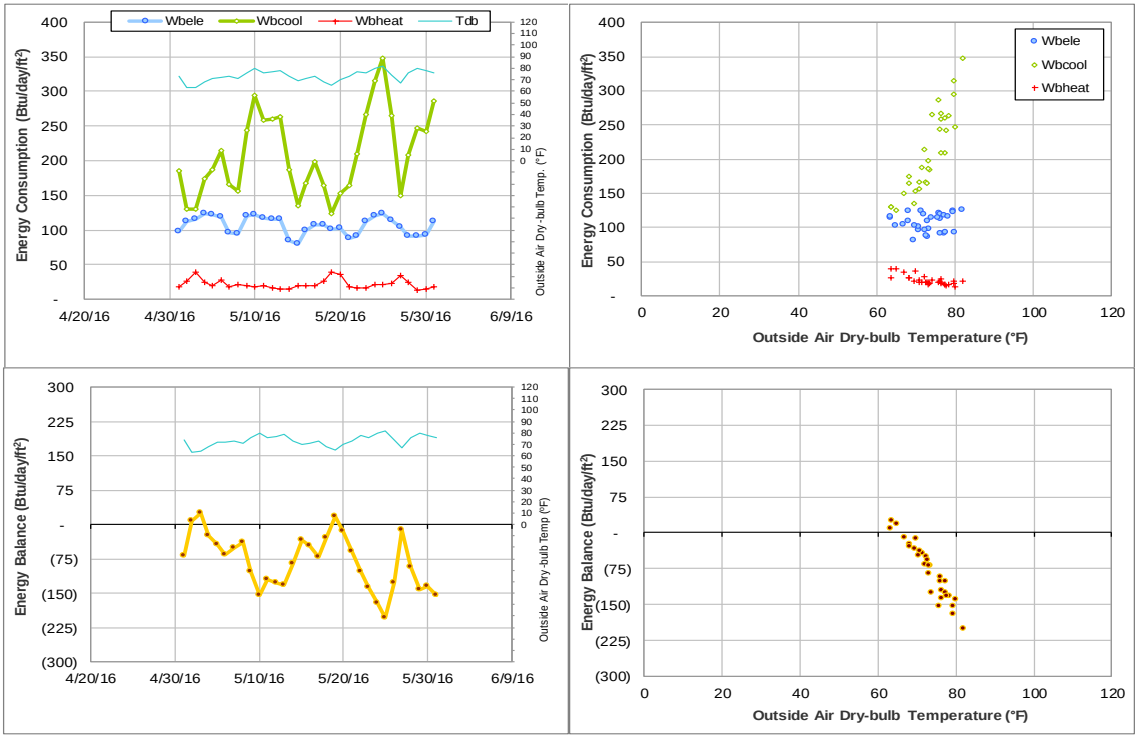


Figure IV-69 Rudder Tower TAMU BLDG # 446 Energy Balance Plot during May 2016

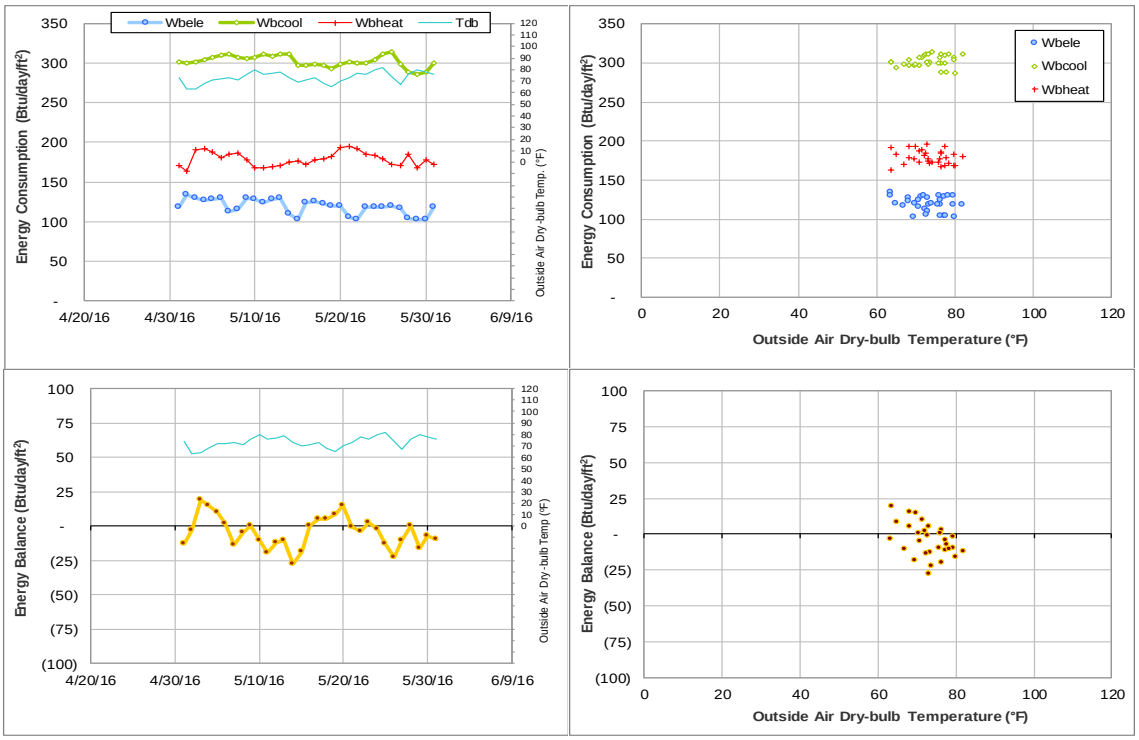


Figure IV-70 Adams Band Hall TAMU BLDG # 448 Energy Balance Plot during May 2016

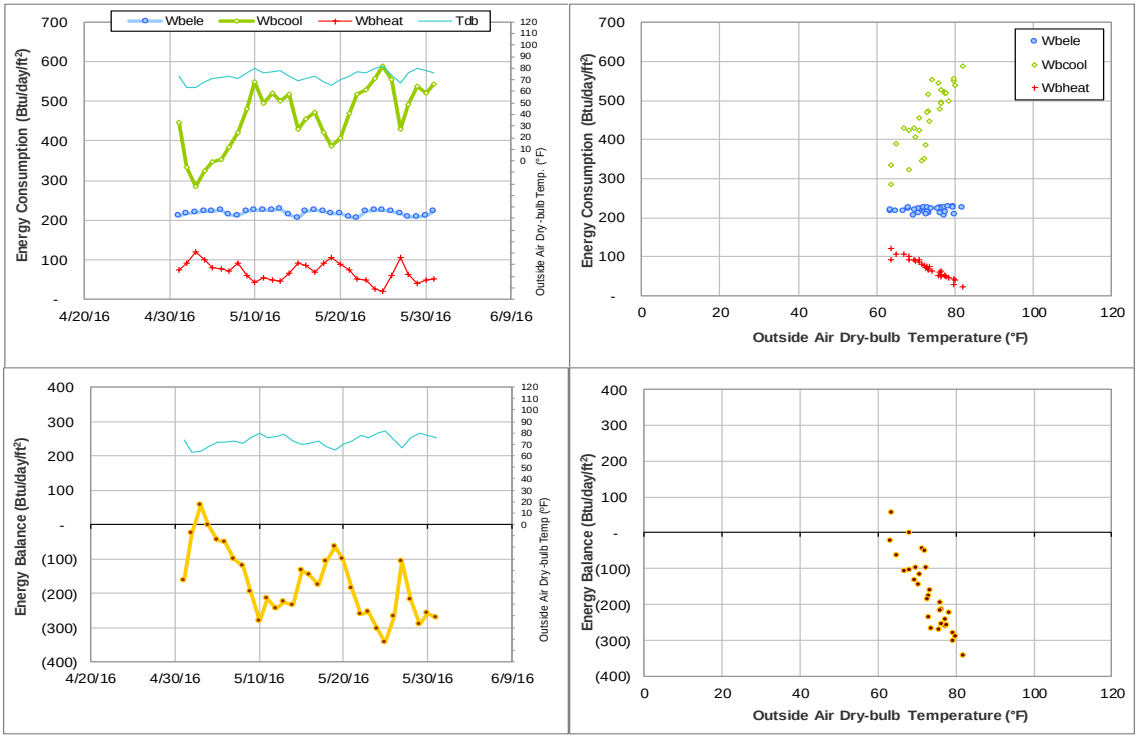


Figure IV-71 Biological Sciences Building - West TAMU BLDG # 449 Energy Balance Plot during May 2016

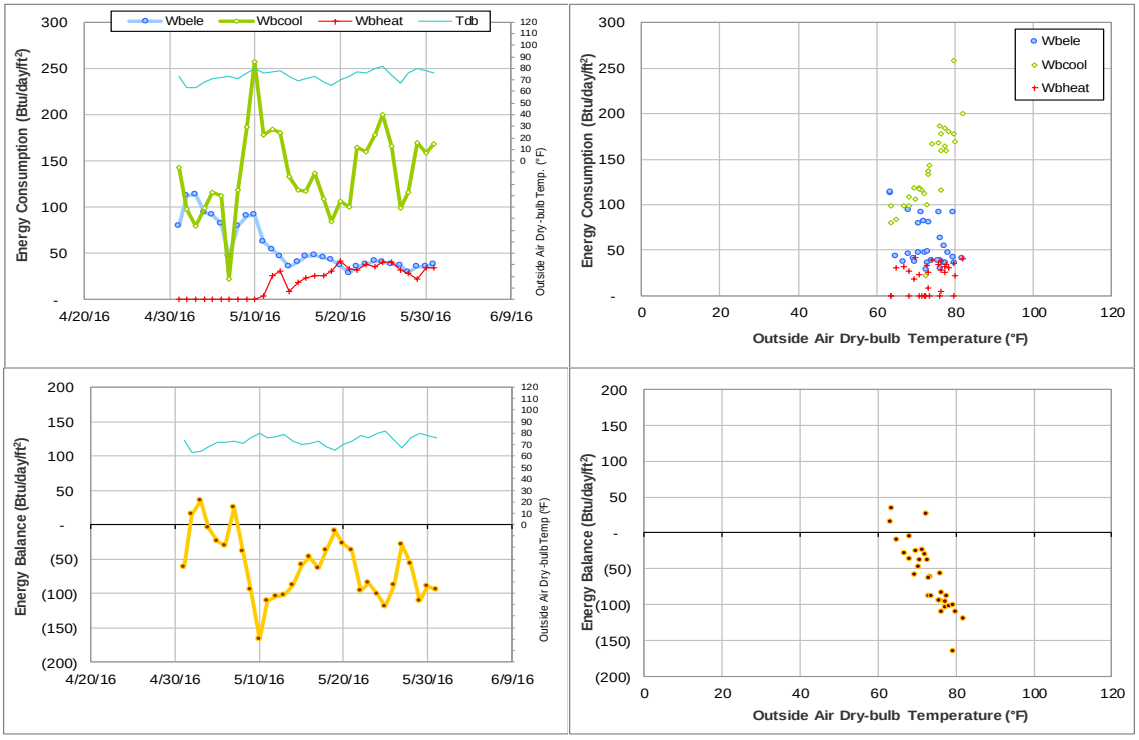


Figure IV-72 Duncan Dining Hall TAMU BLDG # 450 Energy Balance Plot during May 2016

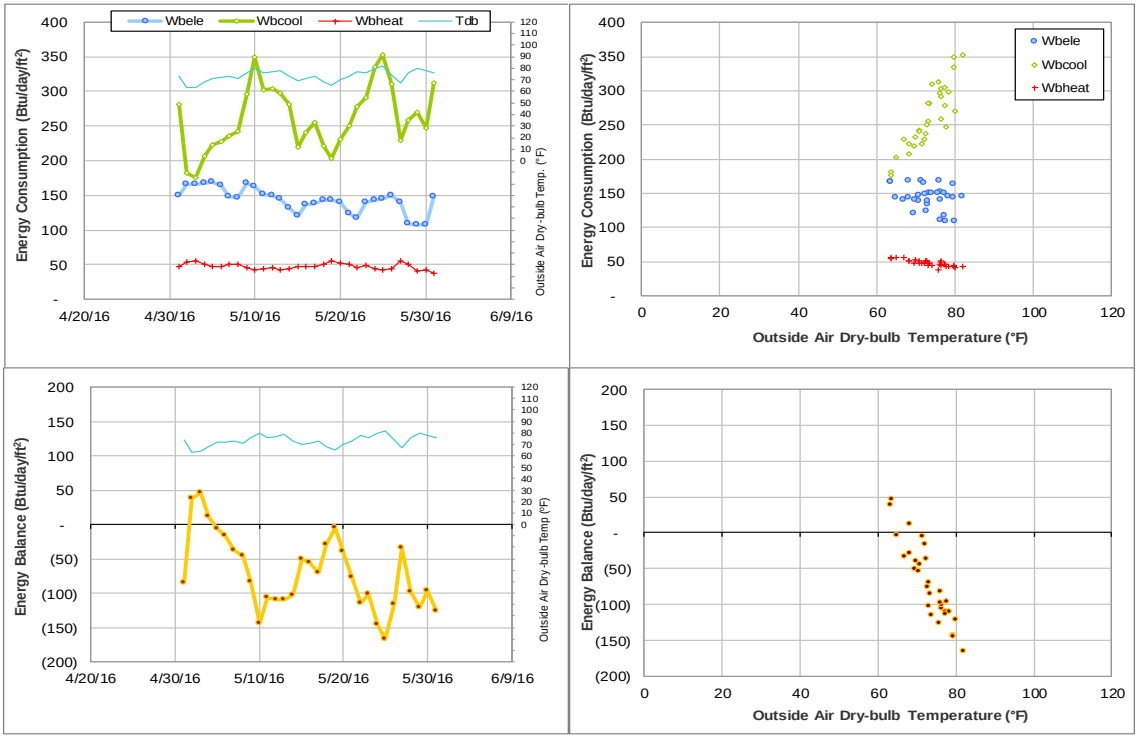


Figure IV-73 MSC TAMU BLDG # 454 Energy Balance Plot during May 2016

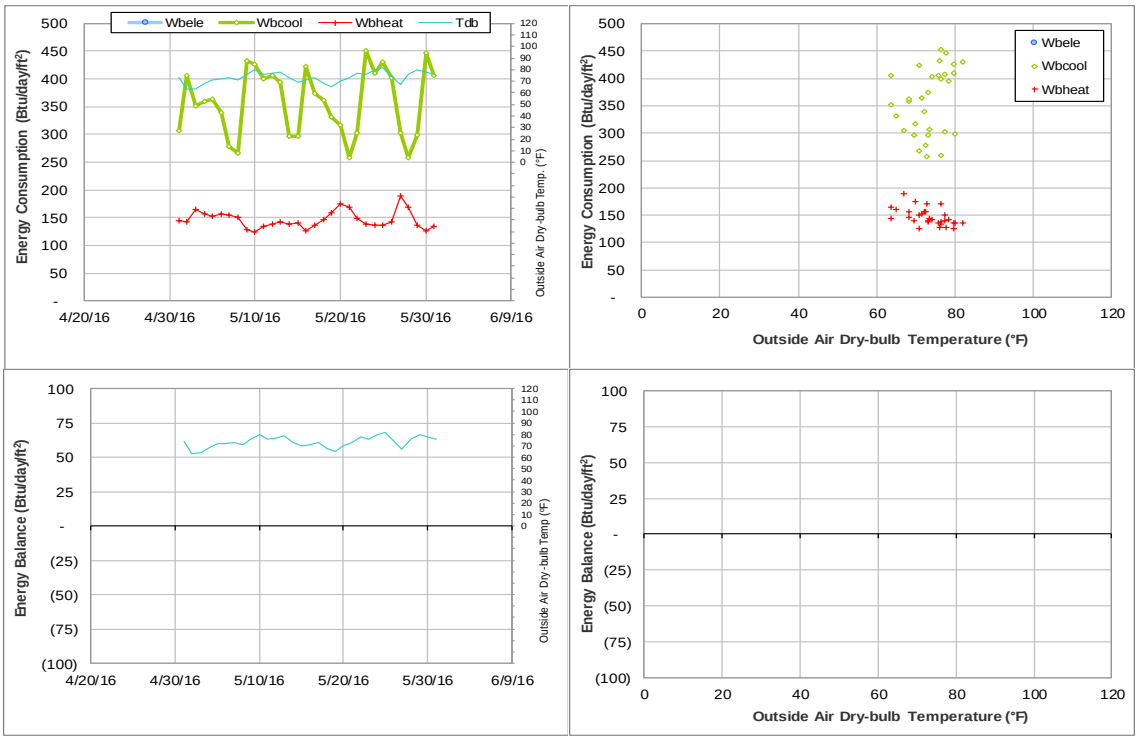


Figure IV-74 Military Sciences Building TAMU BLDG # 456 Energy Balance Plot during May 2016

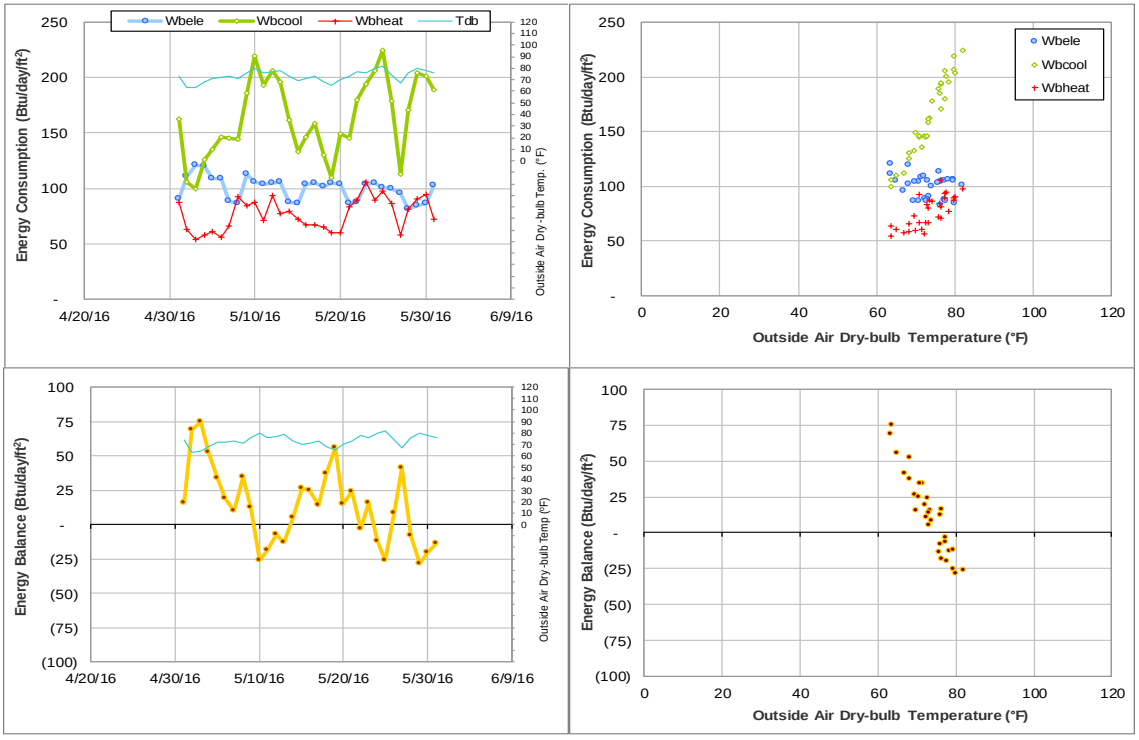


Figure IV-75 TAES Annex Building TAMU BLDG # 457 Energy Balance Plot during May 2016

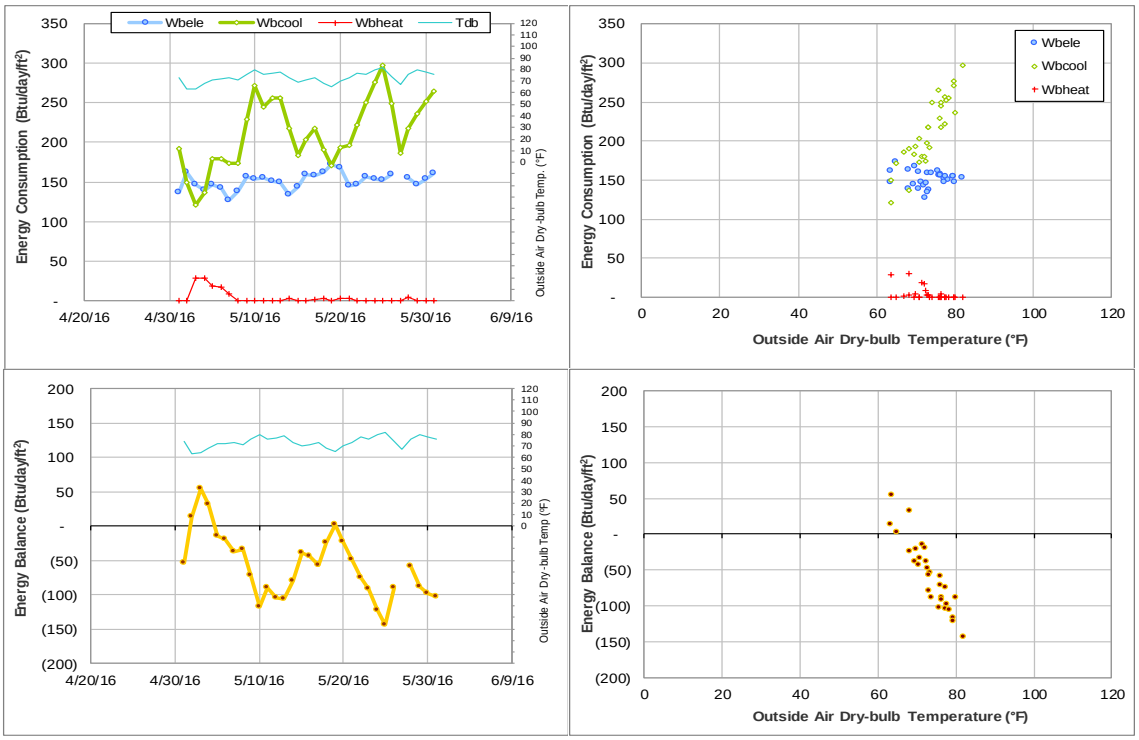


Figure IV-76 Coke Building TAMU BLDG # 461 Energy Balance Plot during May 2016

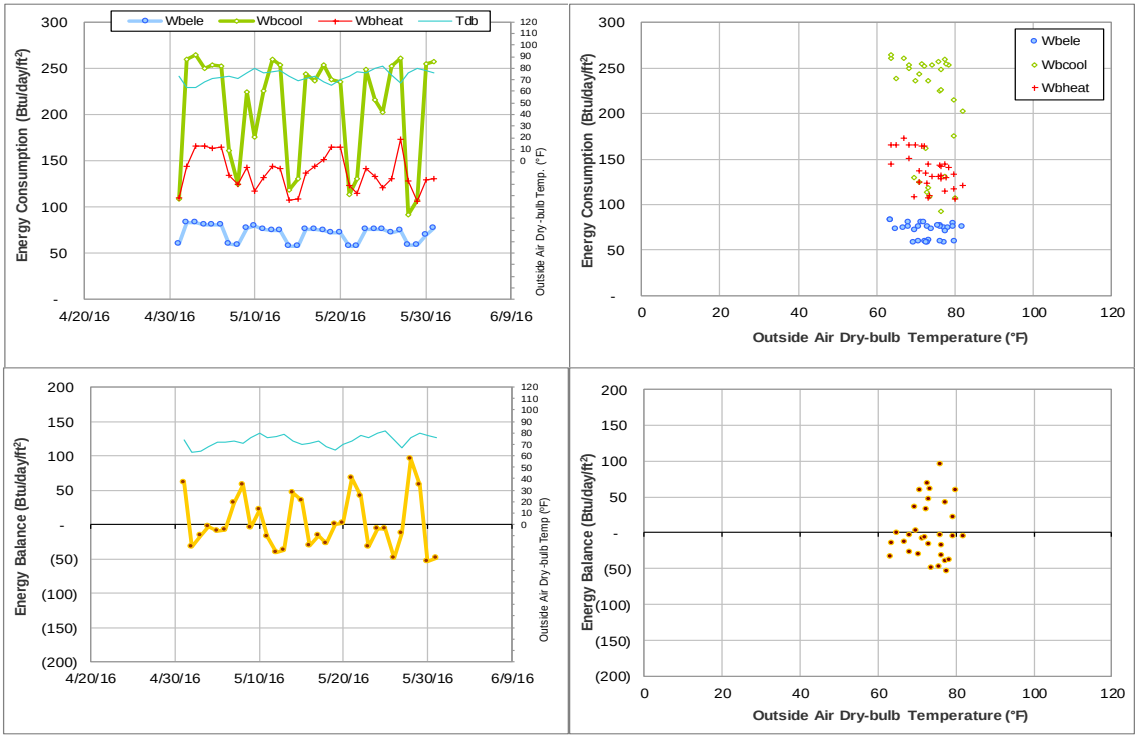


Figure IV-77 Academic Building TAMU BLDG # 462 Energy Balance Plot during May 2016

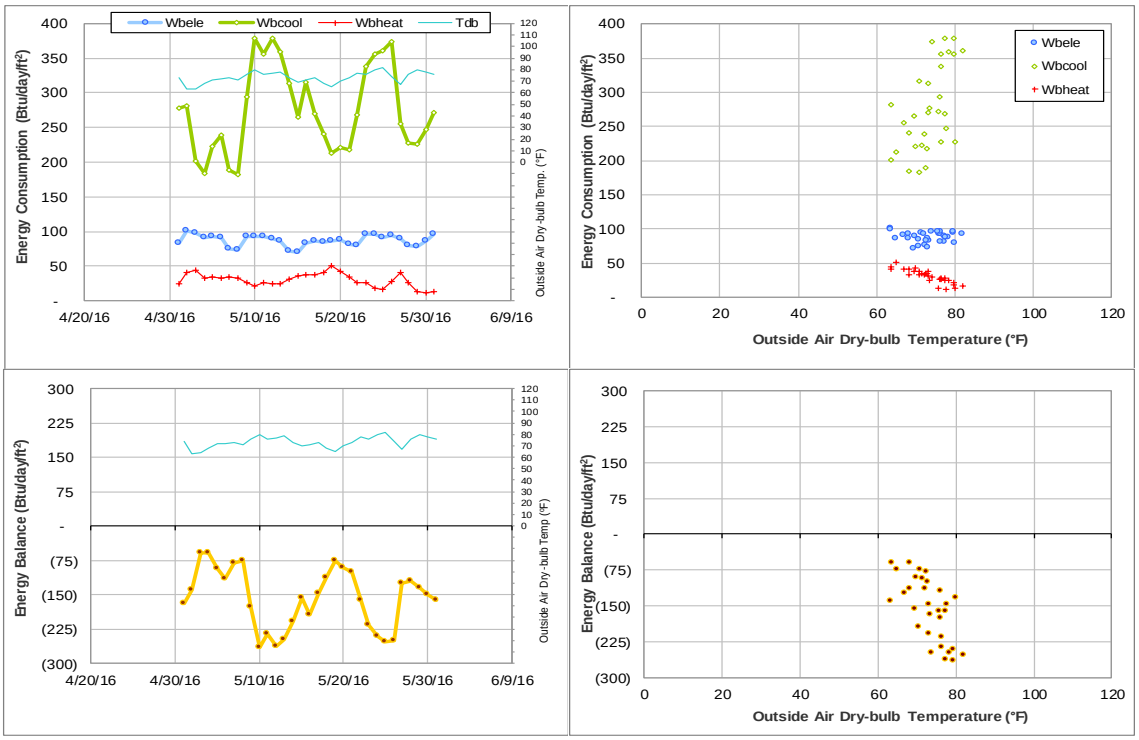


Figure IV-78 Psychology Building TAMU BLDG # 463 Energy Balance Plot during May 2016

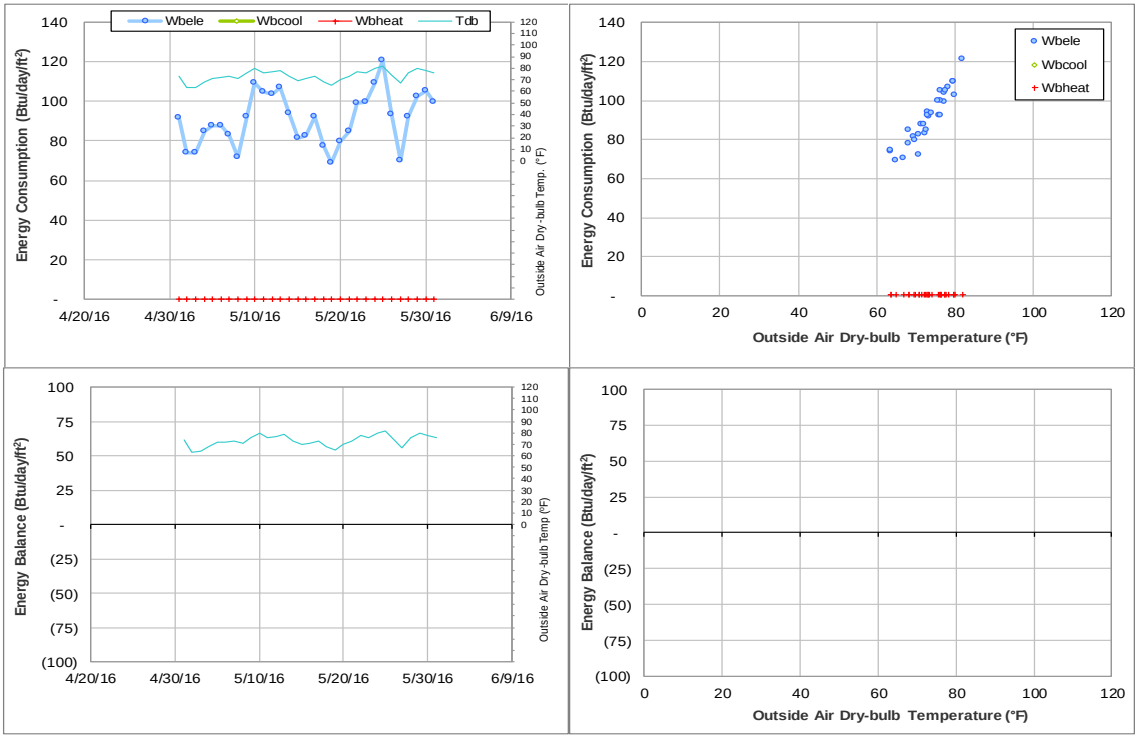


Figure IV-79 State Chemist Building TAMU BLDG # 464 Energy Balance Plot during May 2016

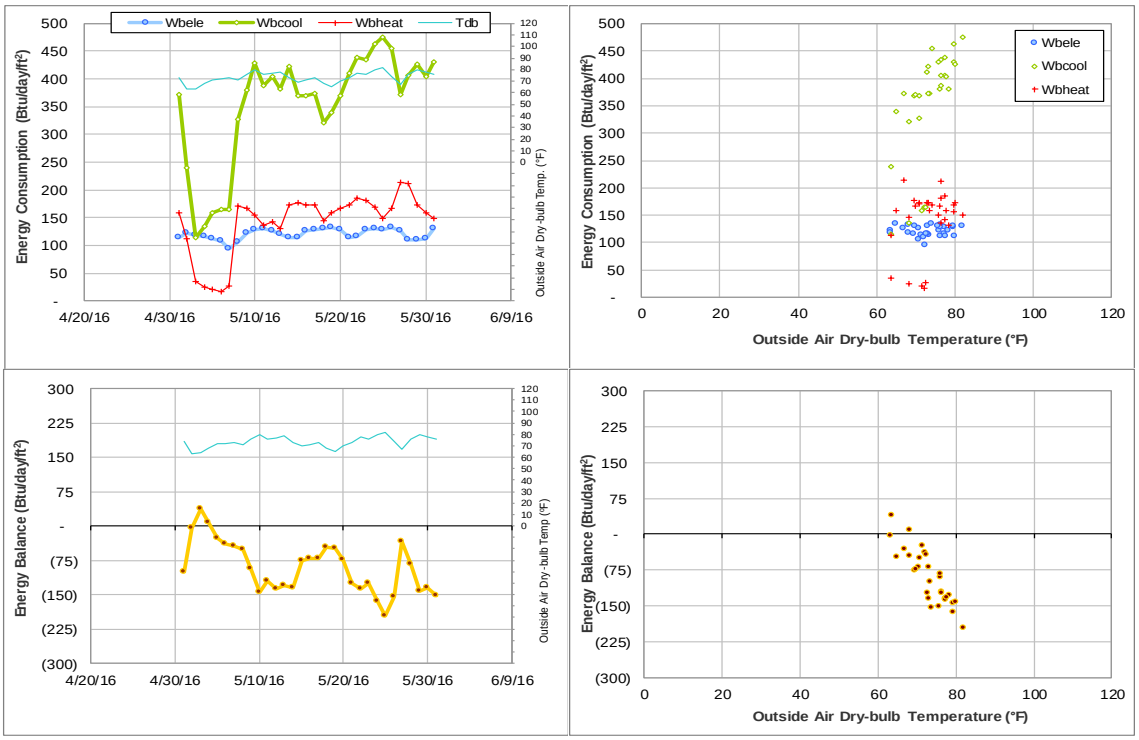


Figure IV-80 Butler Hall TAMU BLDG # 465 Energy Balance Plot during May 2016

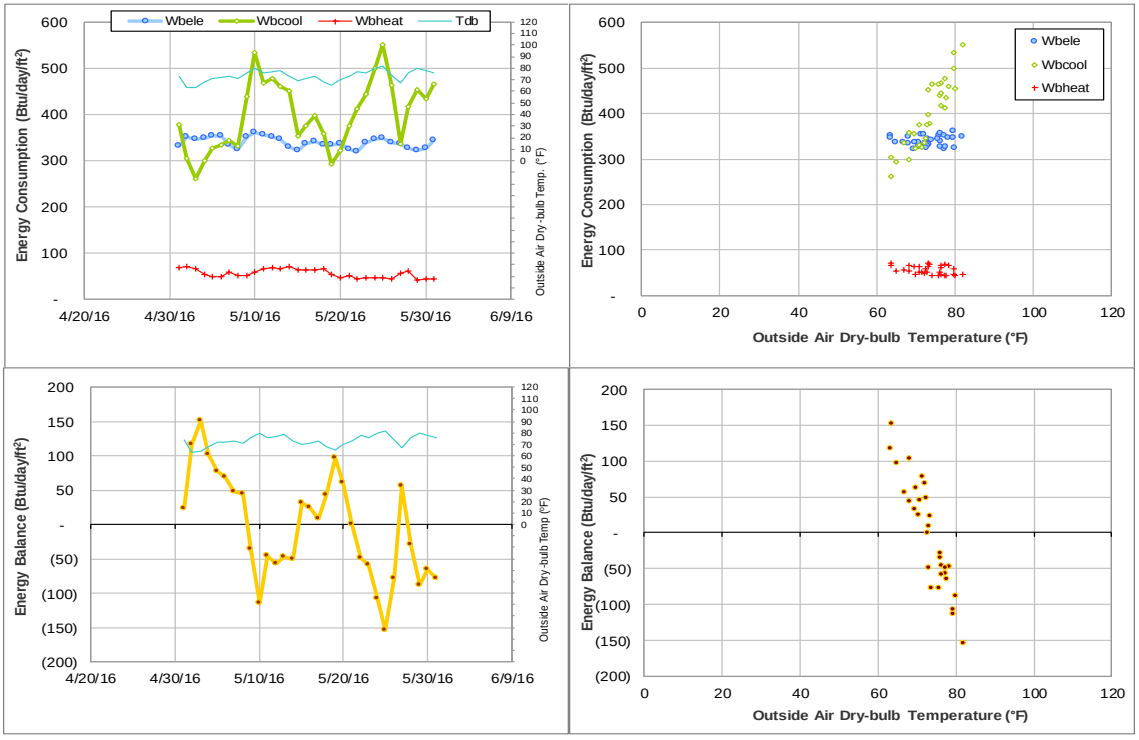


Figure IV-81 Biological Sciences Building - East TAMU BLDG # 467 Energy Balance Plot during May 2016

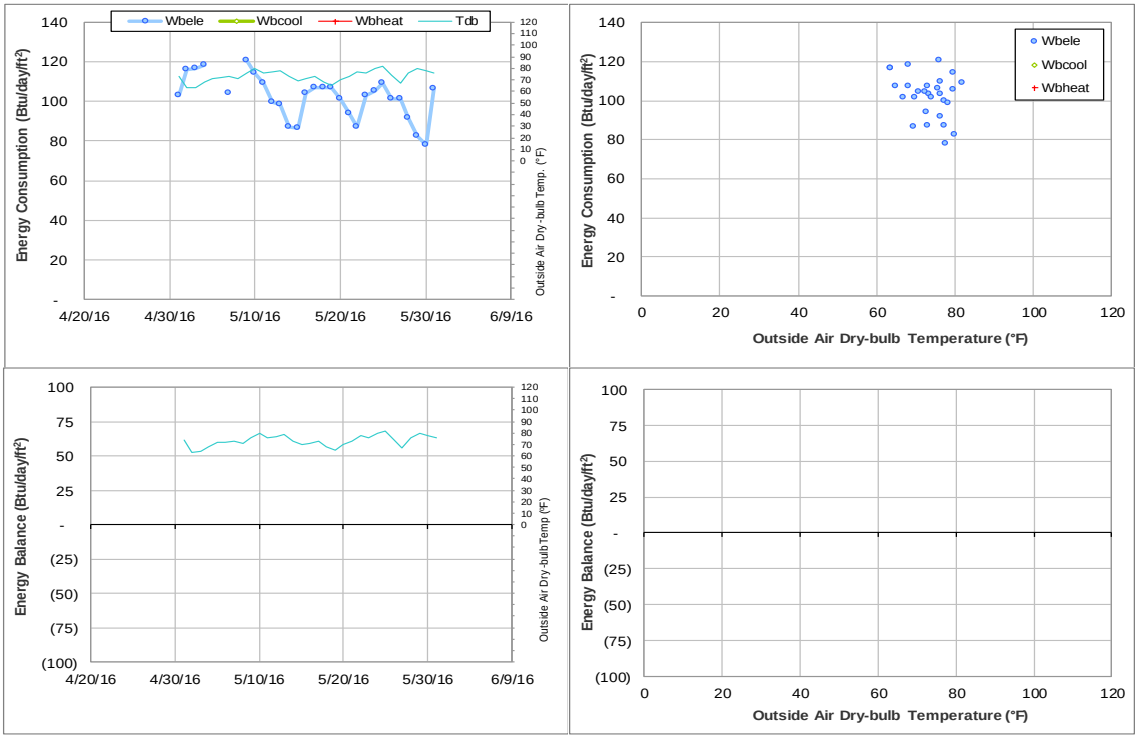


Figure IV-82 Evans Library TAMU BLDG # 468 Energy Balance Plot during May 2016

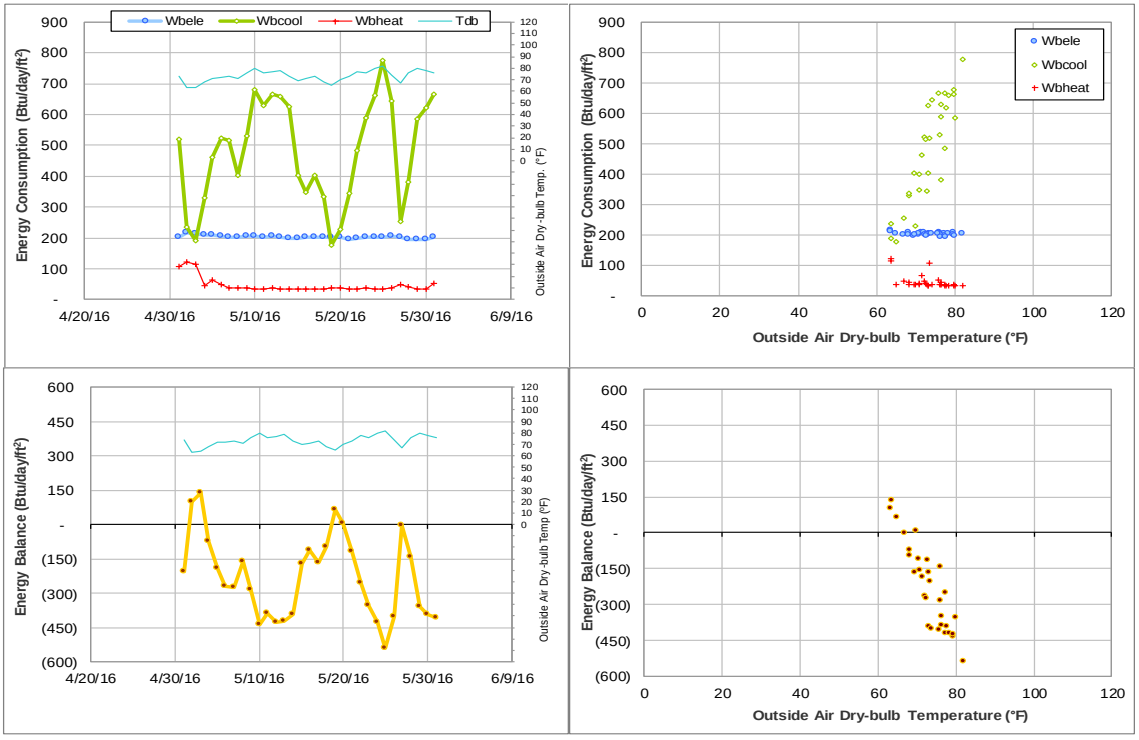


Figure IV-83 Central Campus Parking Garage TAMU BLDG # 469 Energy Balance Plot during May 2016

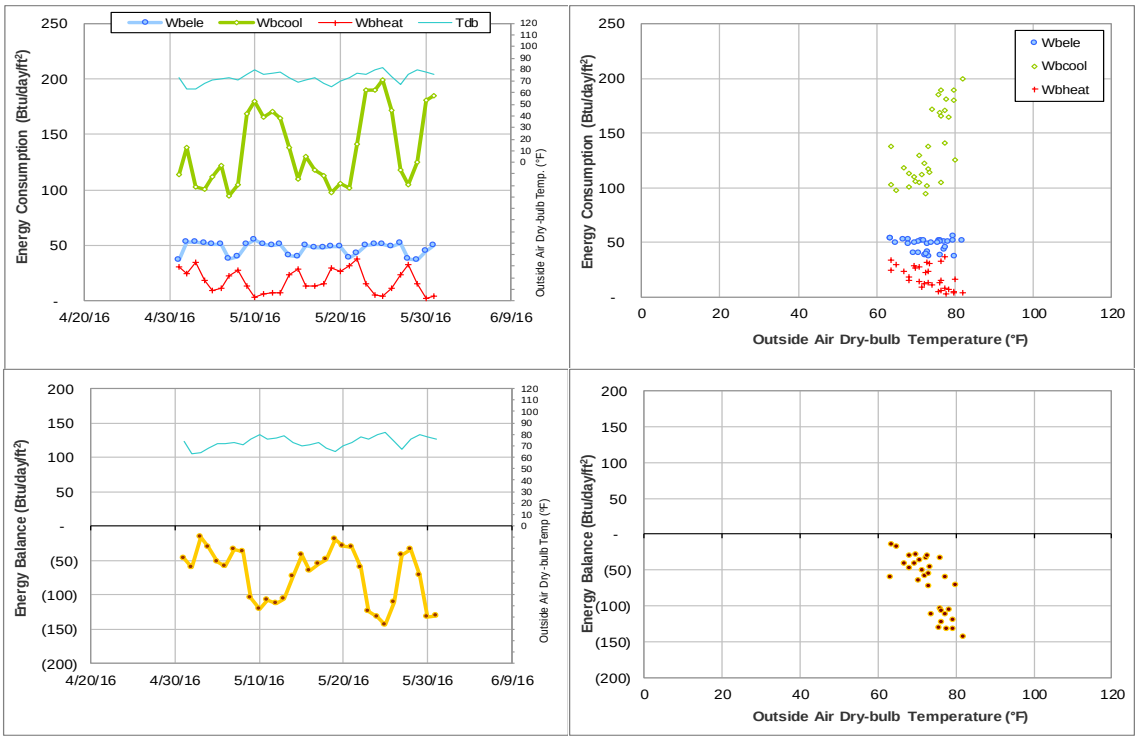


Figure IV-84 Glasscock History Bldg TAMU BLDG # 470 Energy Balance Plot during May 2016

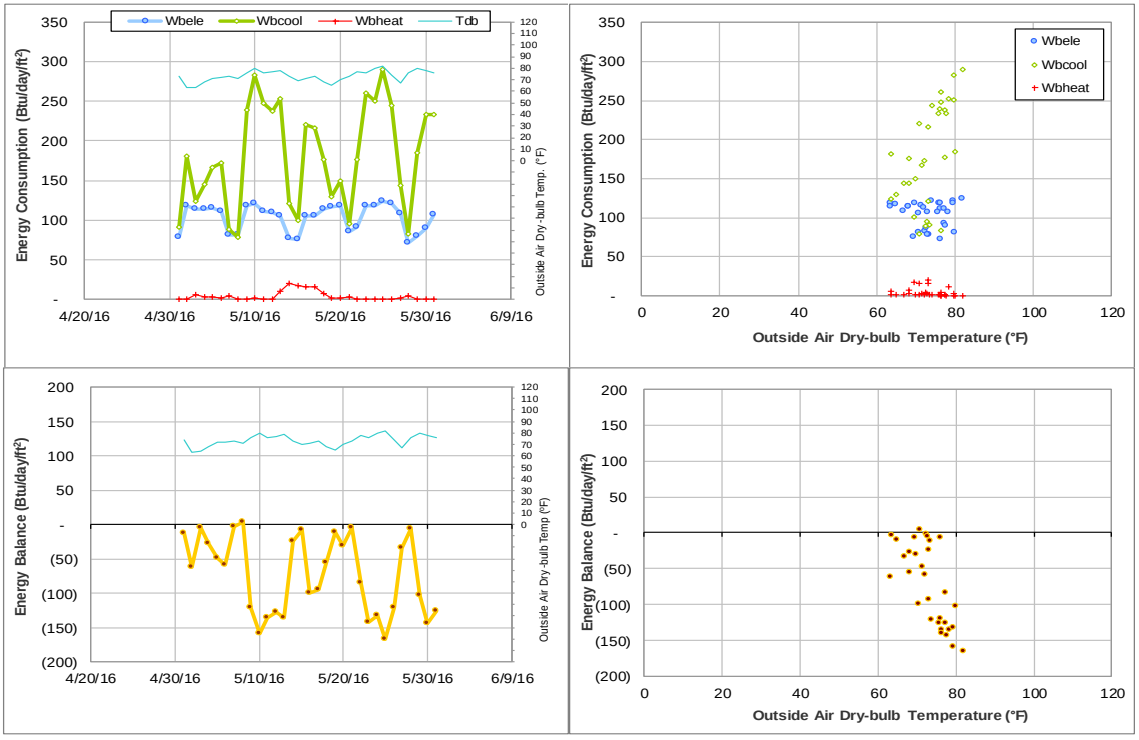


Figure IV-85 Pavilion TAMU BLDG # 471 Energy Balance Plot during May 2016

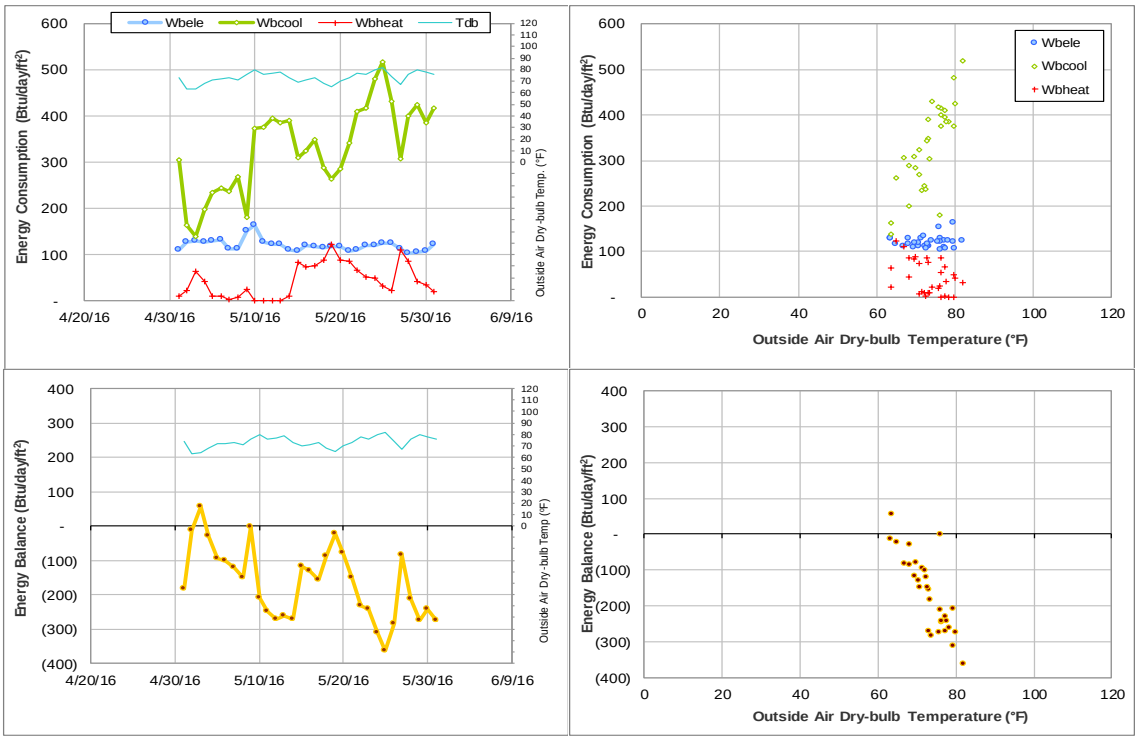


Figure IV-86 Animal Industries TAMU BLDG # 472 Energy Balance Plot during May 2016

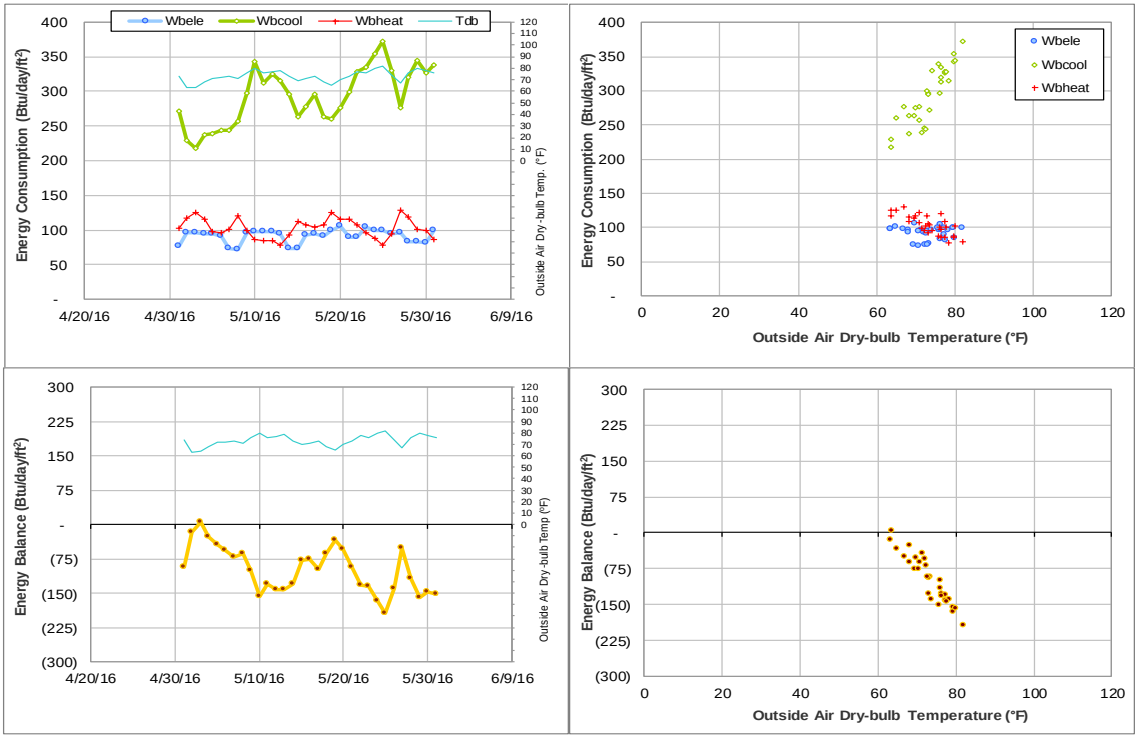


Figure IV-87 Williams Administration Building TAMU BLDG # 473 Energy Balance Plot during May 2016

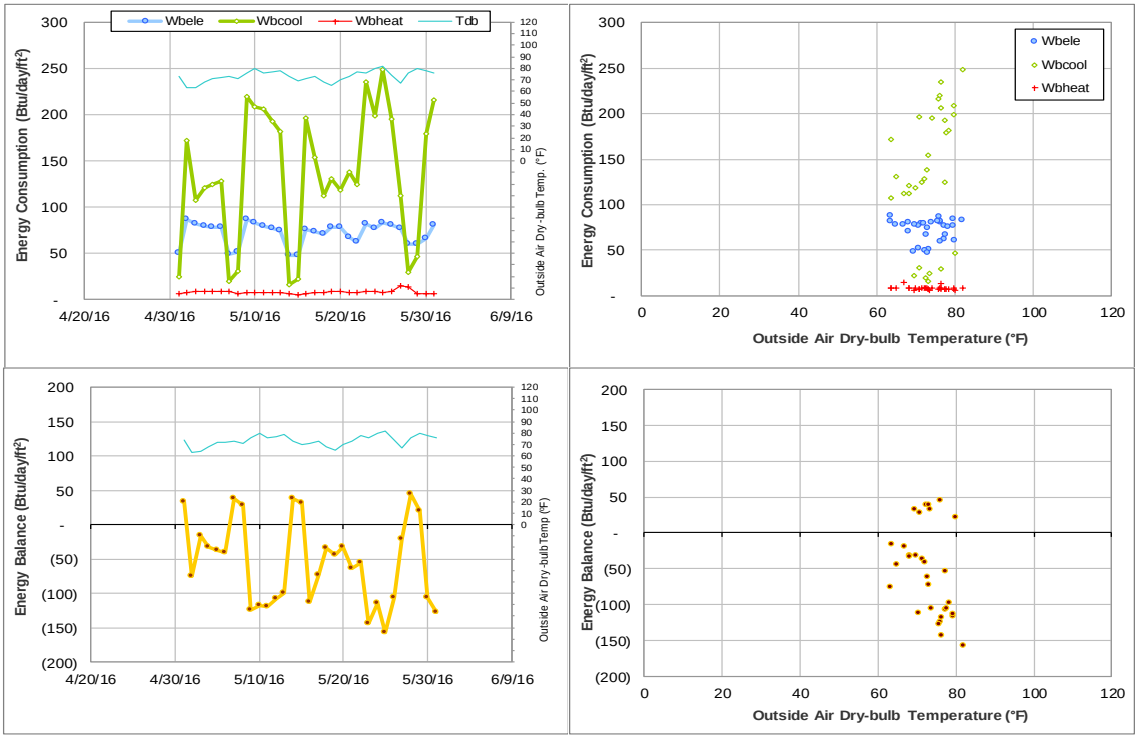


Figure IV-88 YMCA Building TAMU BLDG # 474 Energy Balance Plot during May 2016

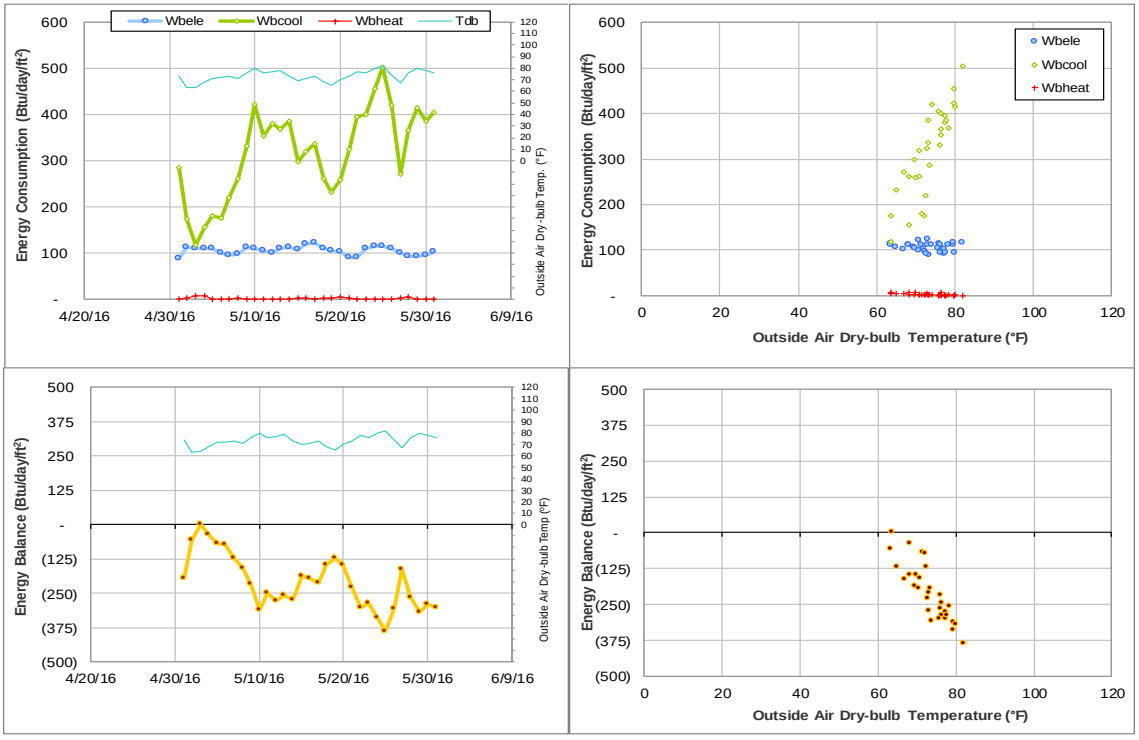


Figure IV-89 Francis Hall TAMU BLDG # 476 Energy Balance Plot during May 2016

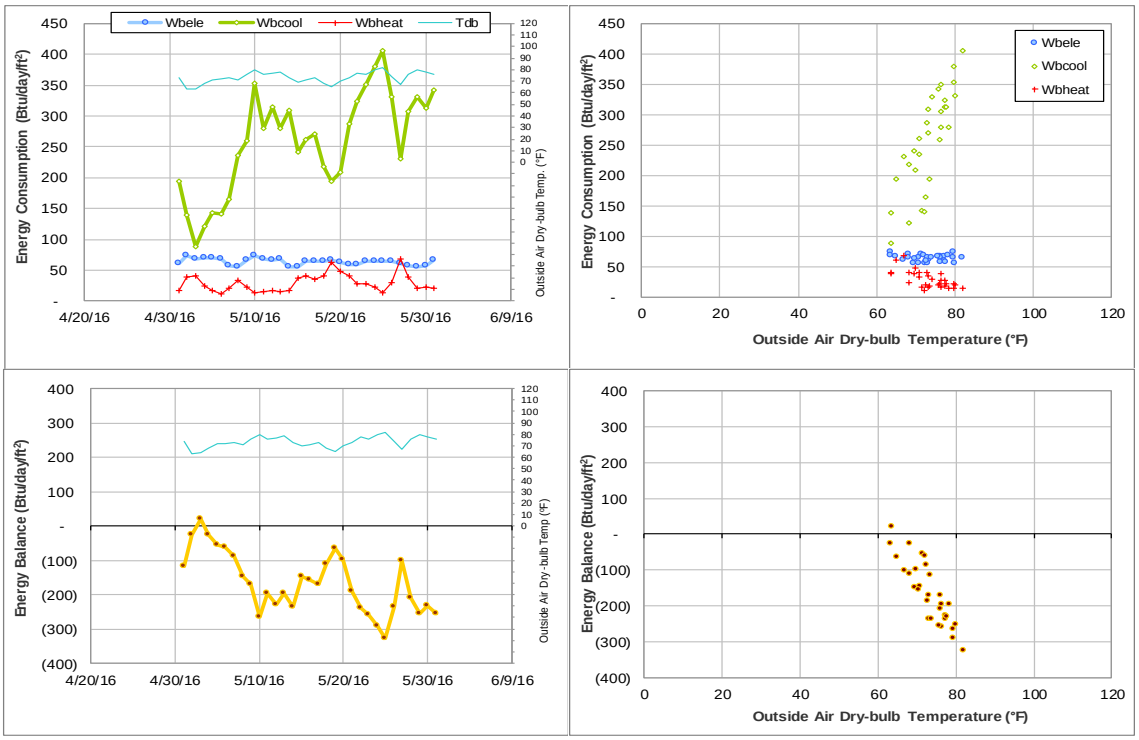


Figure IV-90 Anthropology Building TAMU BLDG # 477 Energy Balance Plot during May 2016

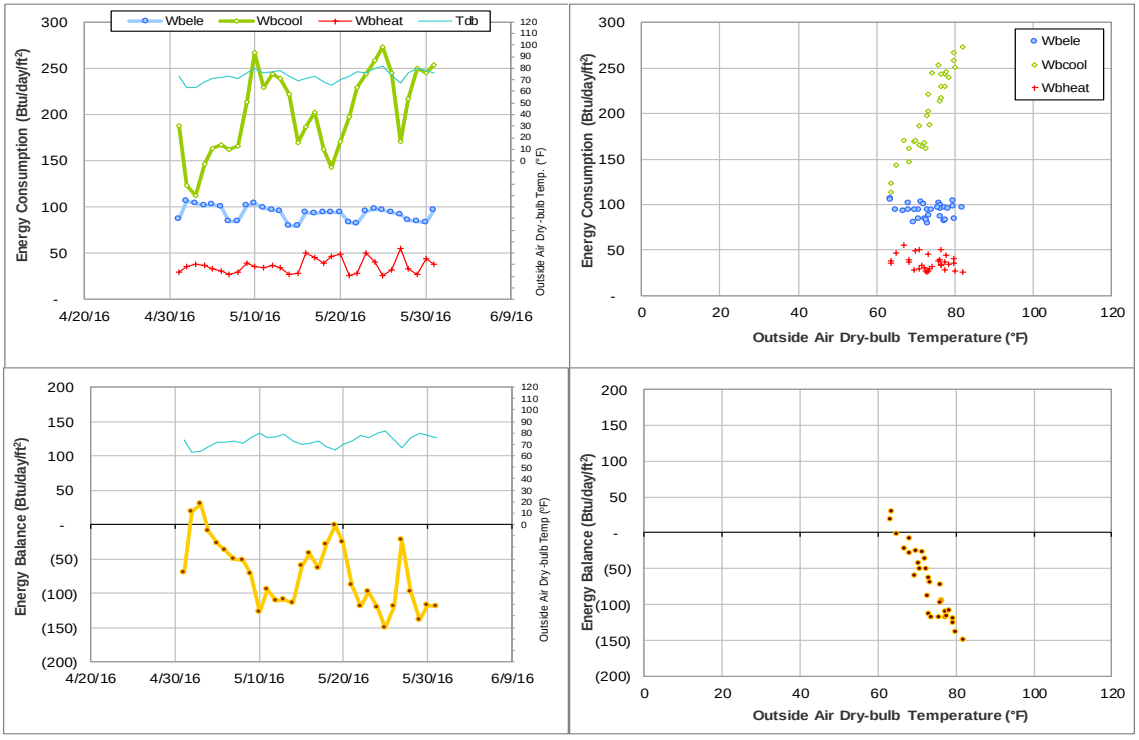


Figure IV-91 Scoates Hall TAMU BLDG # 478 Energy Balance Plot during May 2016

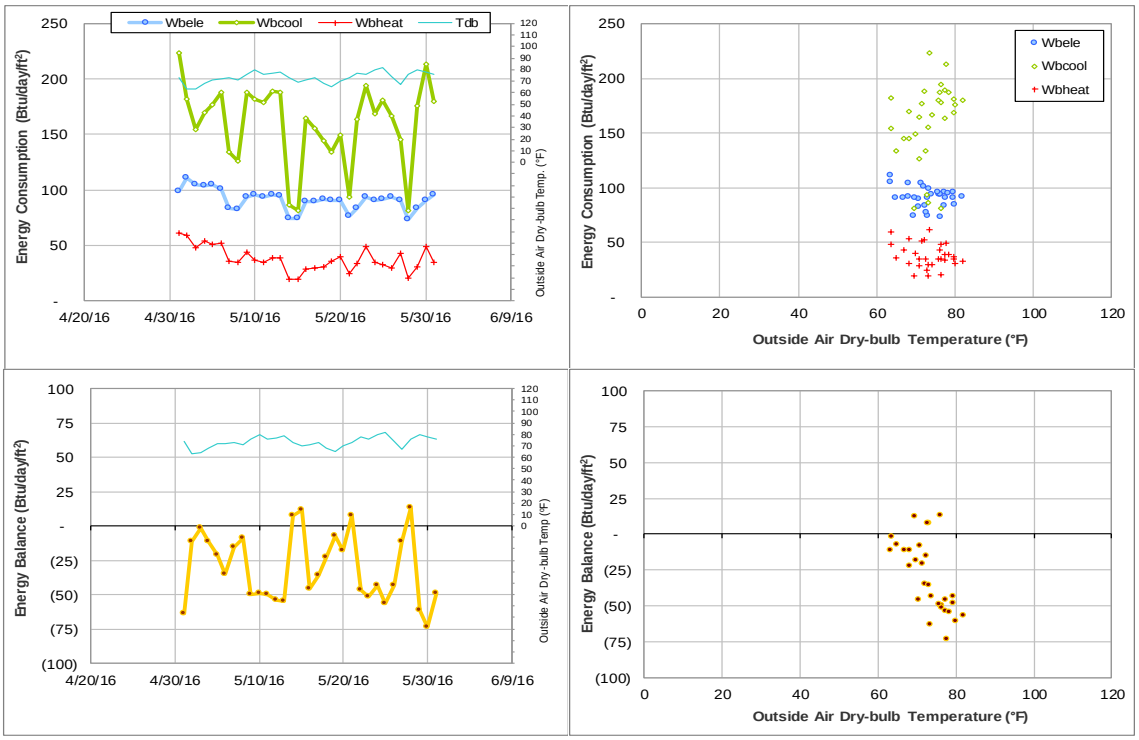


Figure IV-92 Bolton Hall TAMU BLDG # 480 Energy Balance Plot during May 2016

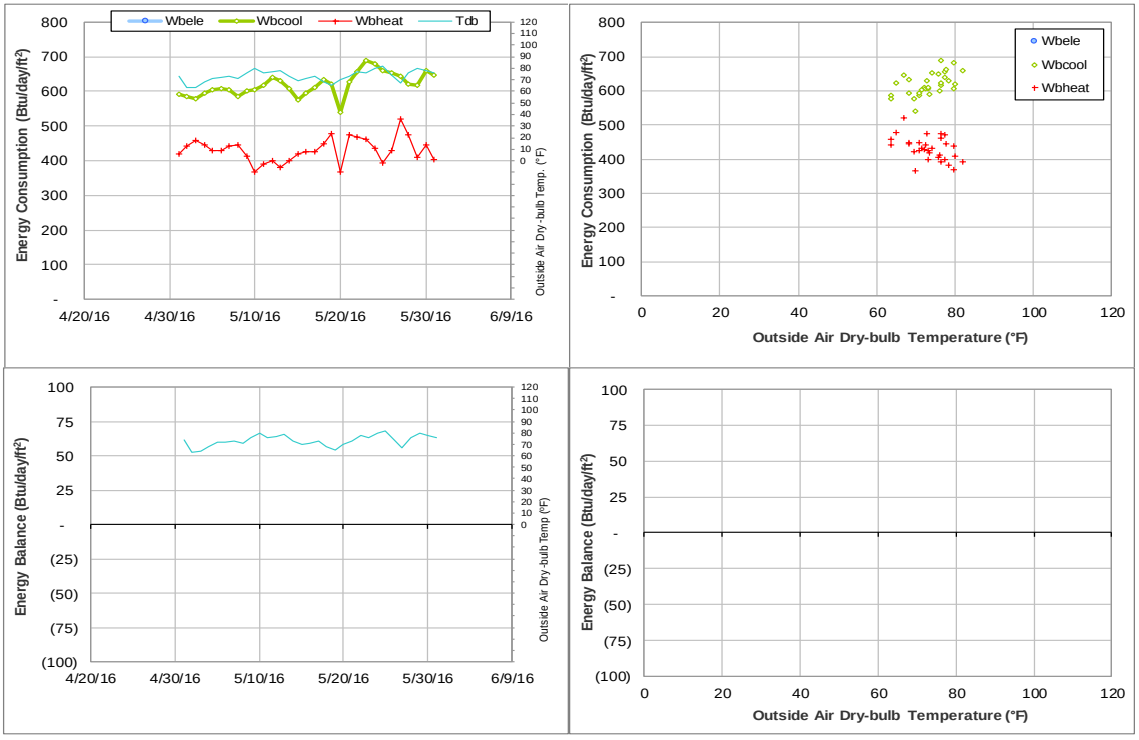


Figure IV-93 Heaton Hall TAMU BLDG # 481 Energy Balance Plot during May 2016

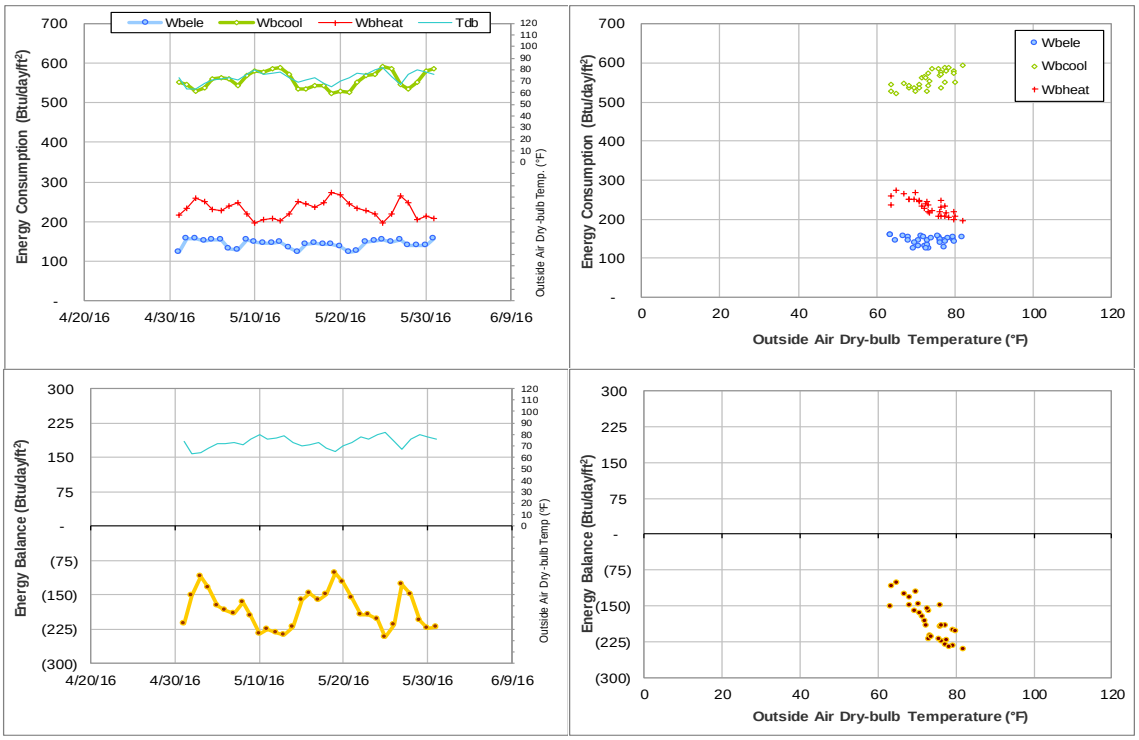


Figure IV-94 Fermier Hall TAMU BLDG # 482 Energy Balance Plot during May 2016

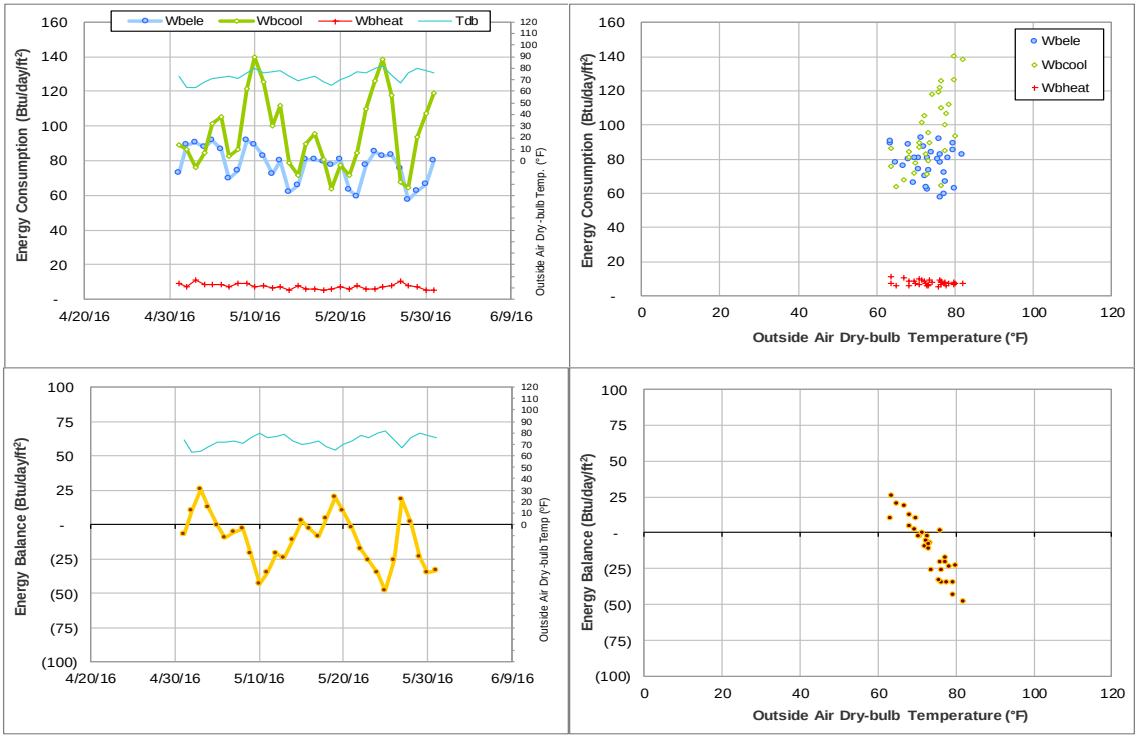


Figure IV-95 Thompson Hall TAMU BLDG # 483 Energy Balance Plot during May 2016

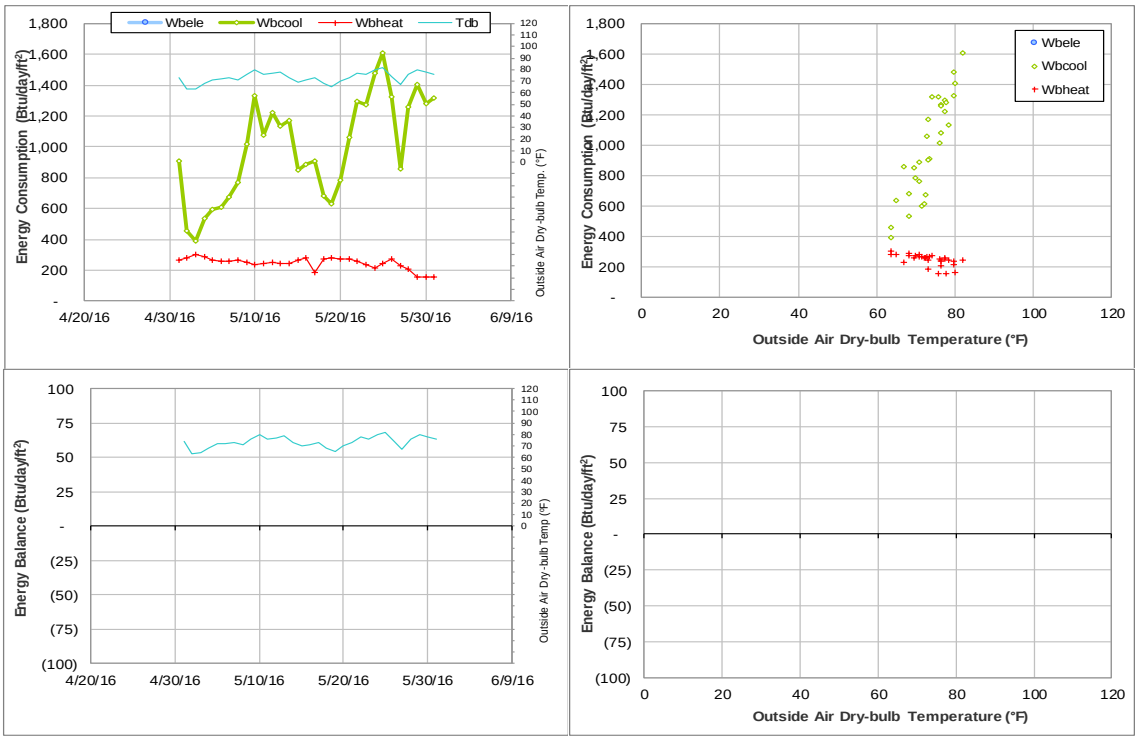


Figure IV-96 Chemistry Building TAMU BLDG # 484 Energy Balance Plot during May 2016

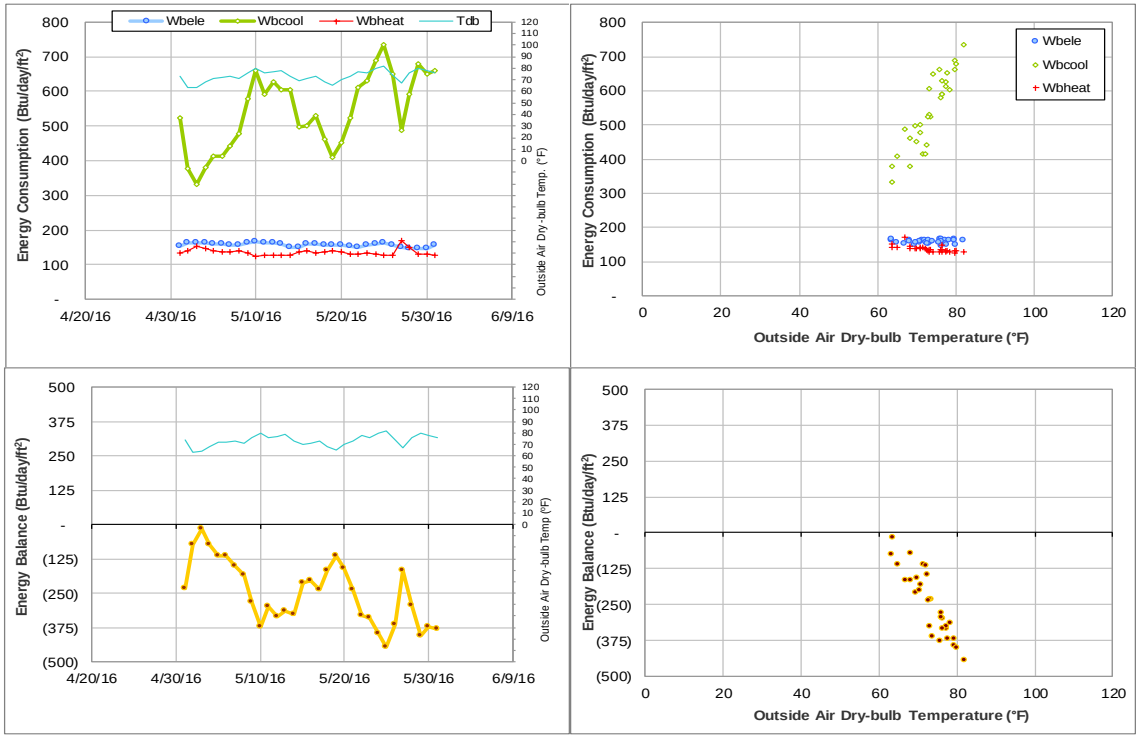


Figure IV-97 Halbouty Geosciences Building TAMU BLDG # 490 Energy Balance Plot during May 2016

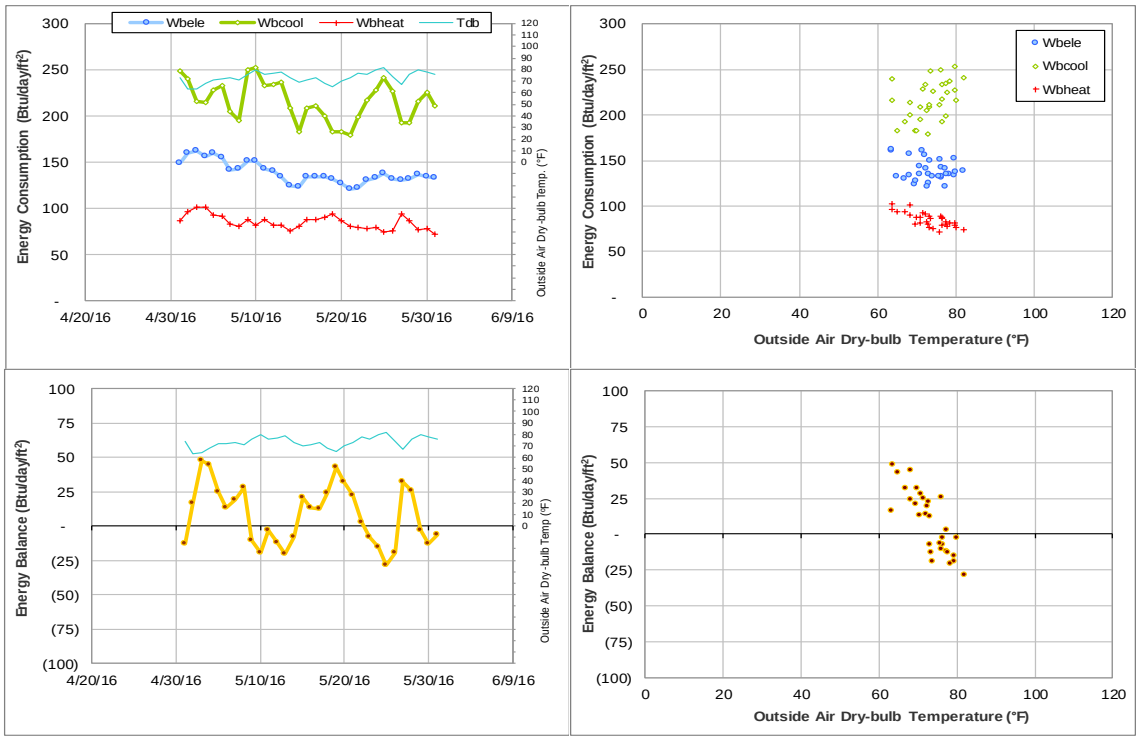


Figure IV-98 Civil Engineering Building TAMU BLDG # 492 Energy Balance Plot during May 2016

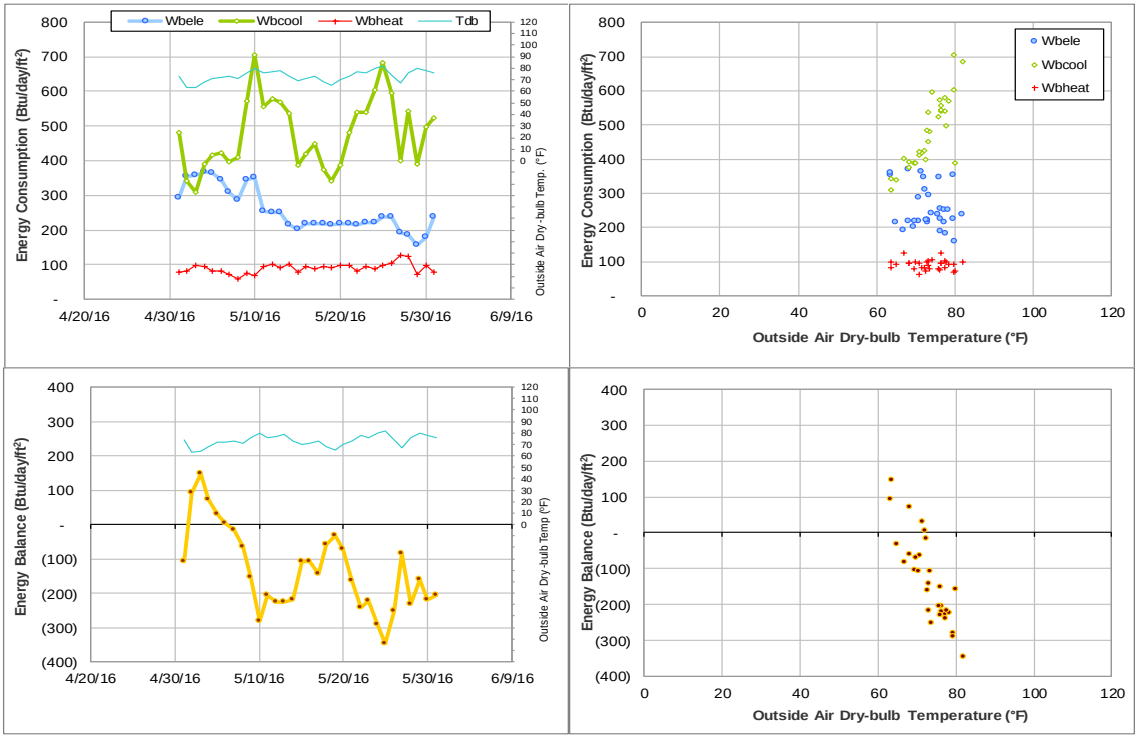


Figure IV-99 Sbisa Dining Hall TAMU BLDG # 495 Energy Balance Plot during May 2016

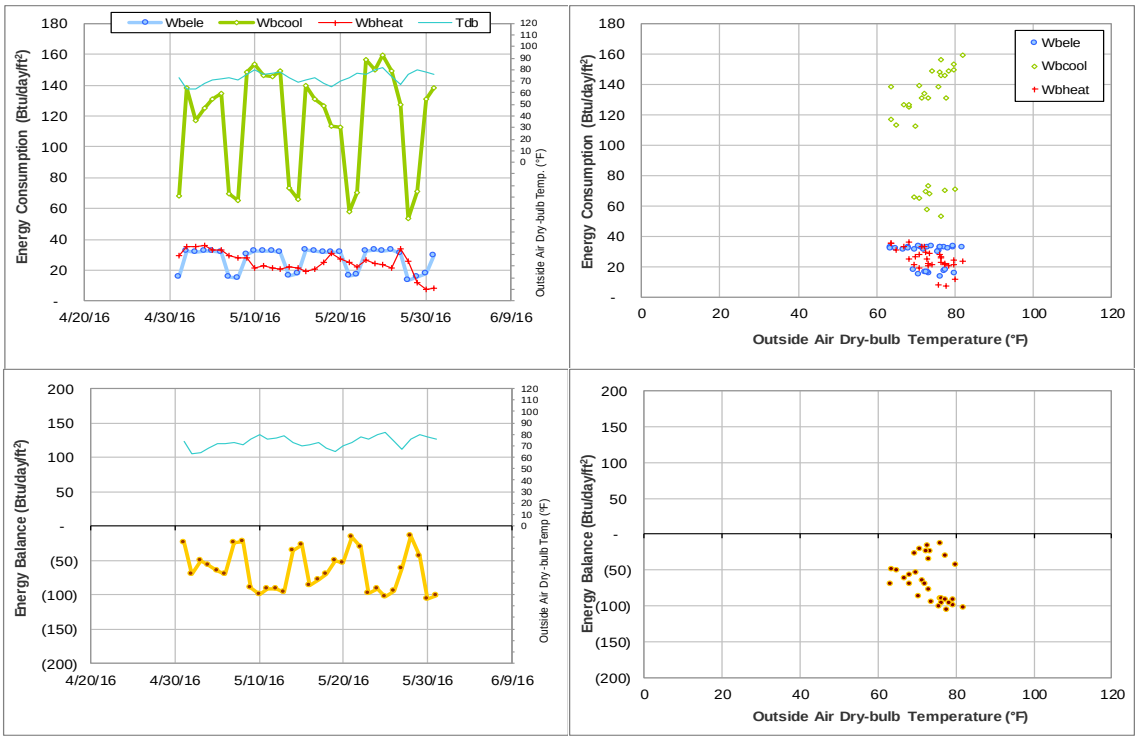


Figure IV-100 Utilities & Energy Services Central Office TAMU BLDG # 496 Energy Balance Plot during May 2016

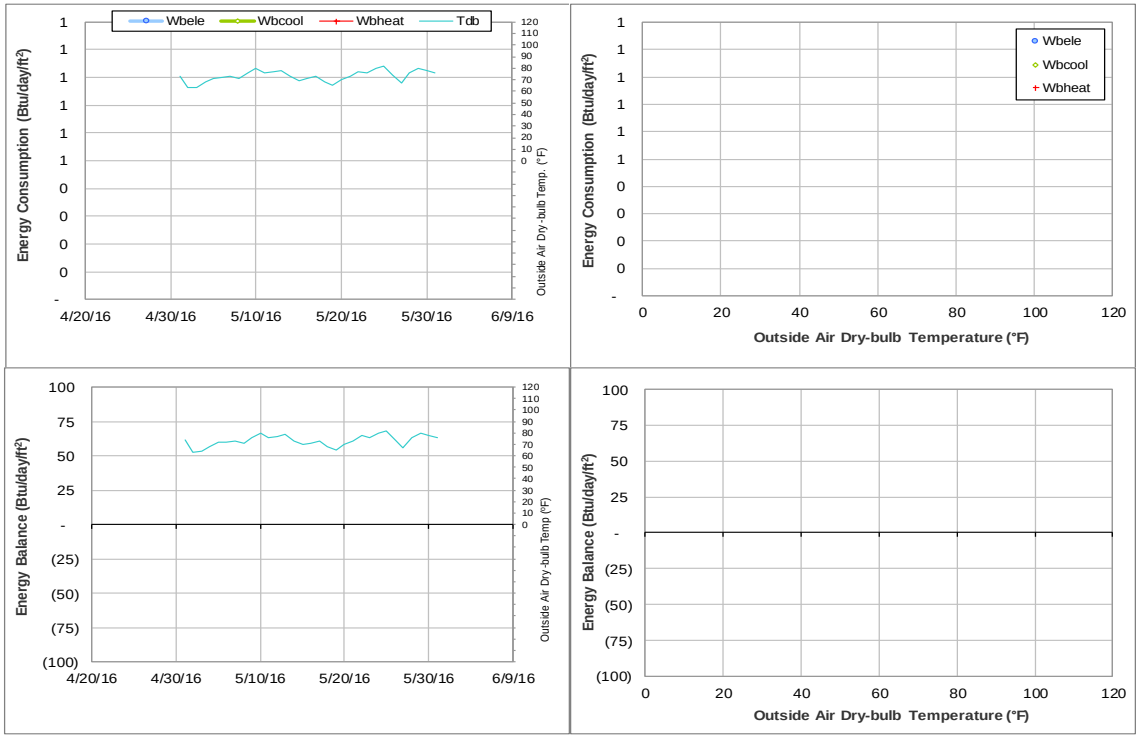


Figure IV-101 Concrete Materials Laboratory TAMU BLDG # 501 Energy Balance Plot during May 2016

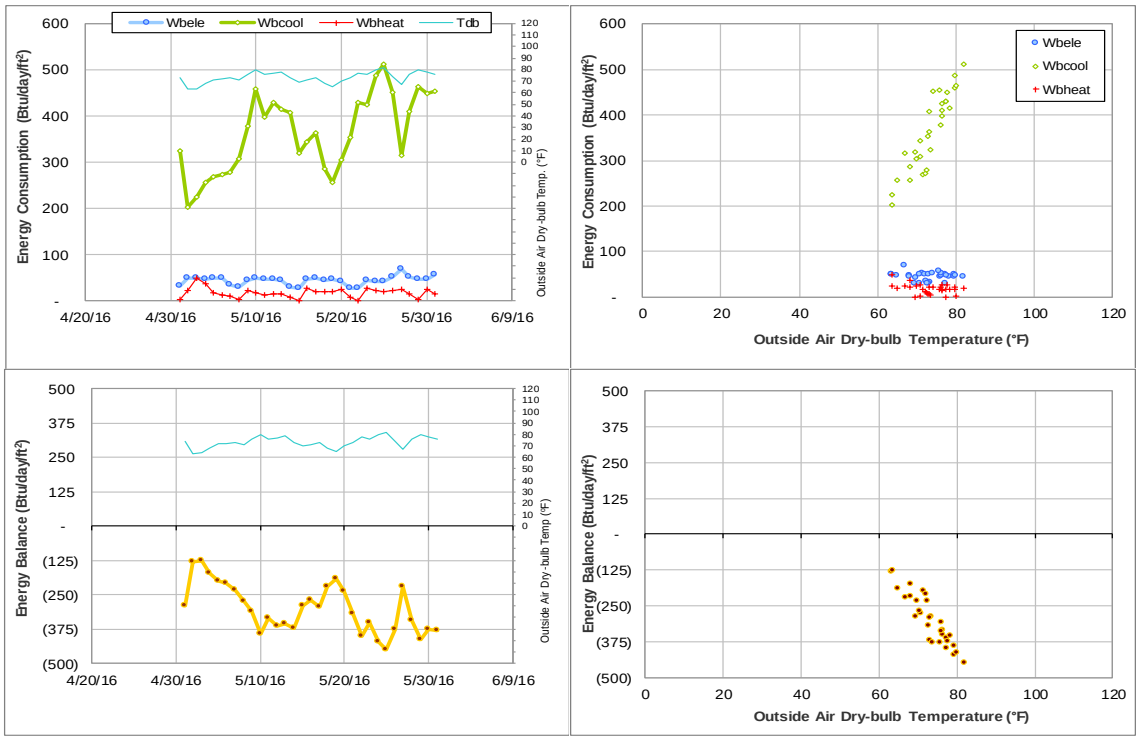


Figure IV-102 Nagle Hall TAMU BLDG # 506 Energy Balance Plot during May 2016

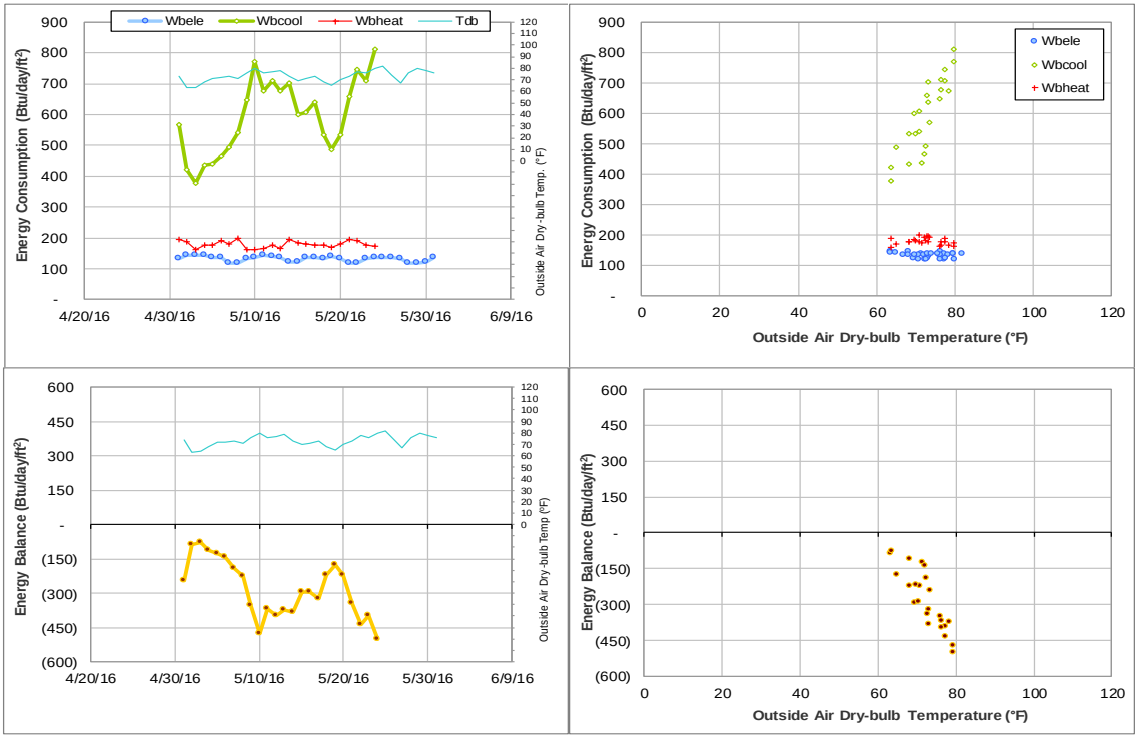


Figure IV-103 Veterinary Medical Science Building TAMU BLDG # 507 Energy Balance Plot during May 2016

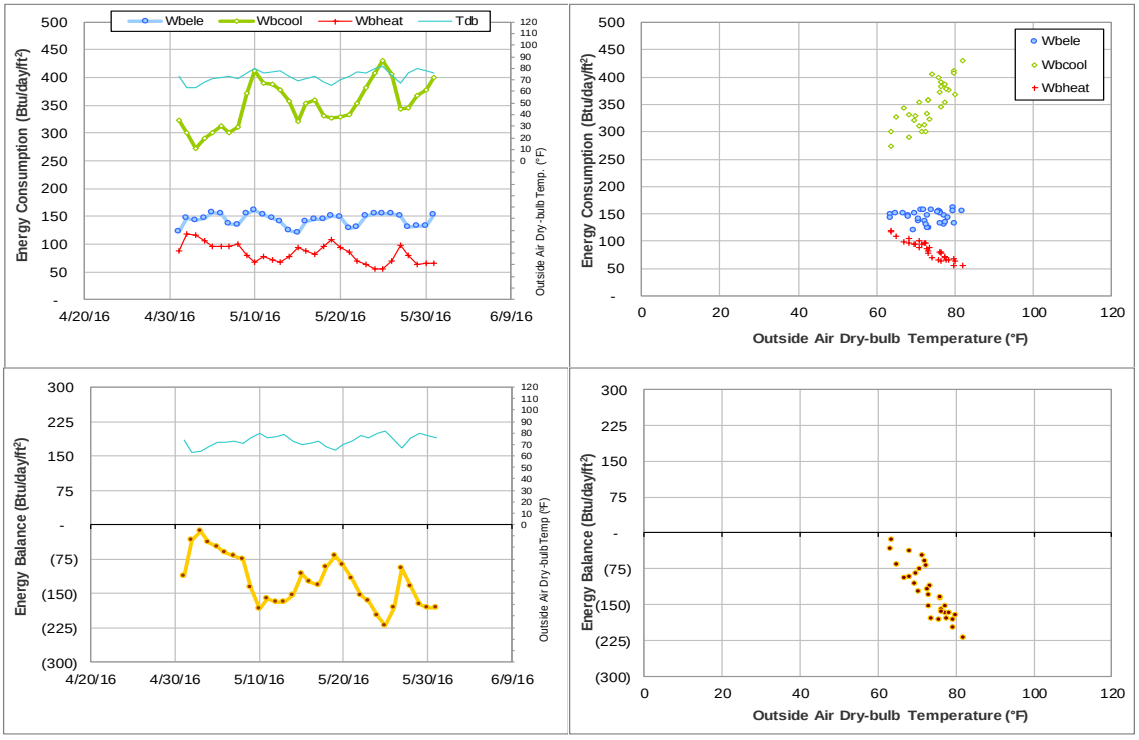


Figure IV-104 Veterinary Teaching Hospital and Med Adm TAMU BLDG # 508-1026 Energy Balance Plot during May 2016

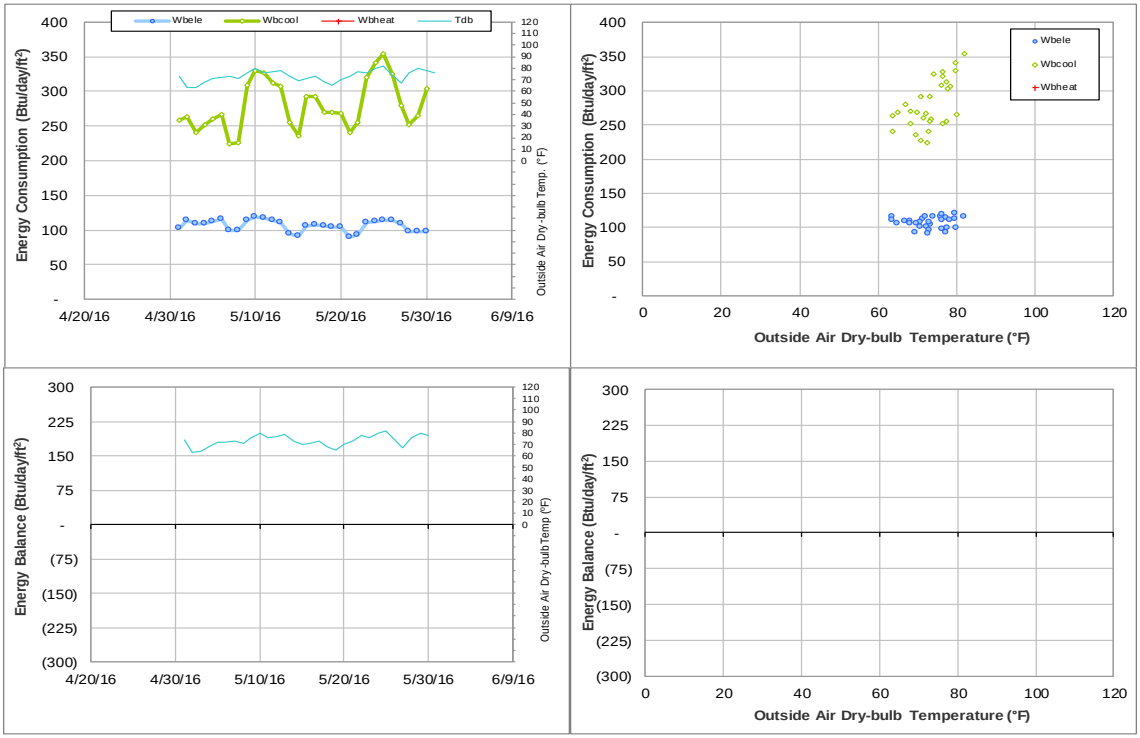


Figure IV-105 Veterinary Teaching Hospital TAMU BLDG # 508 Energy Balance Plot during May 2016

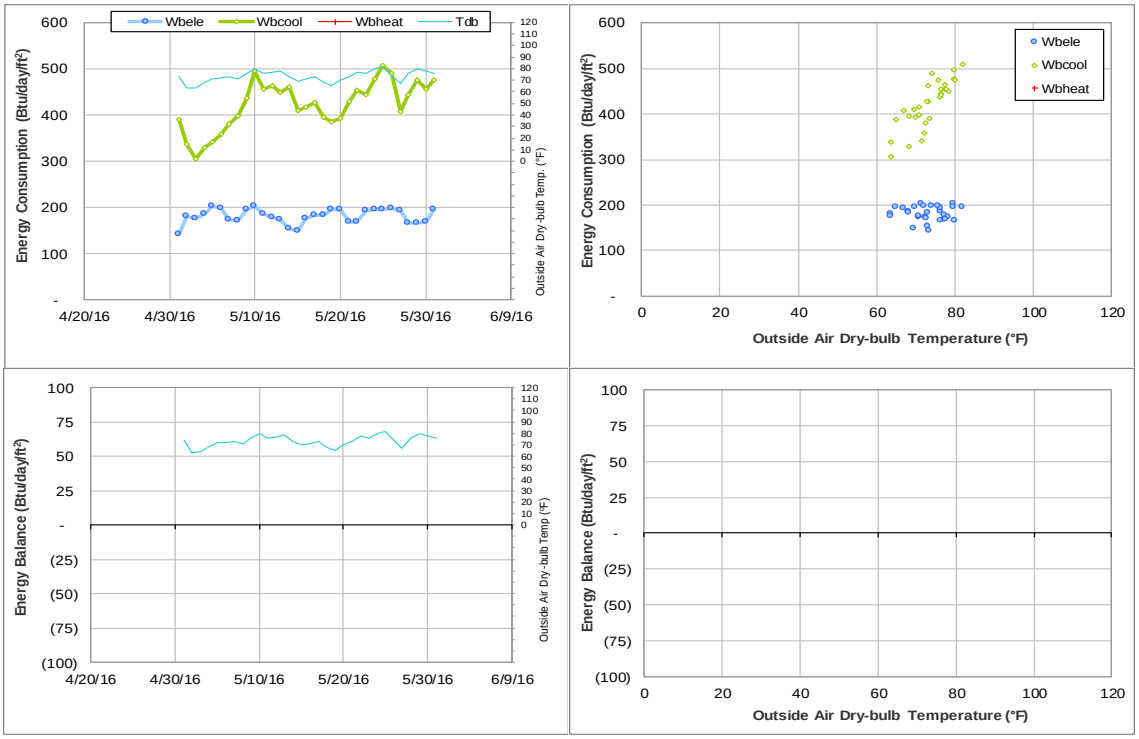


Figure IV-106 Veterinary Medicine Administration TAMU BLDG # 1026 Energy Balance Plot during May 2016

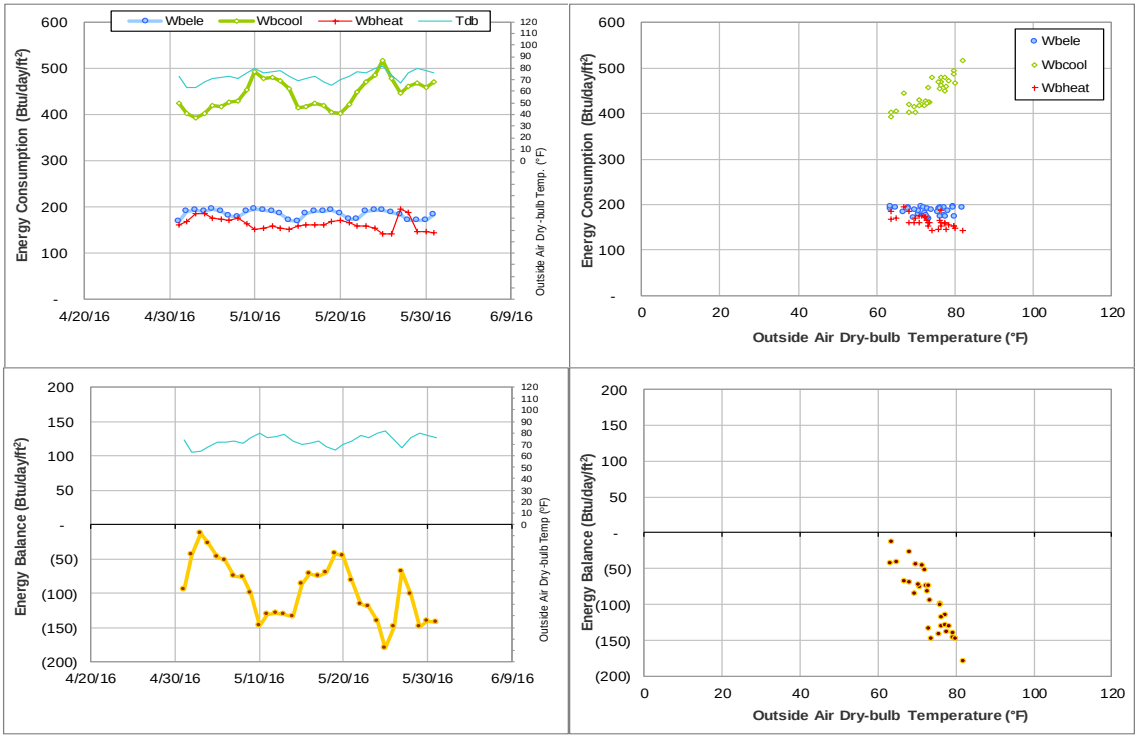


Figure IV-107 Heep Laboratory Building TAMU BLDG # 511 Energy Balance Plot during May 2016

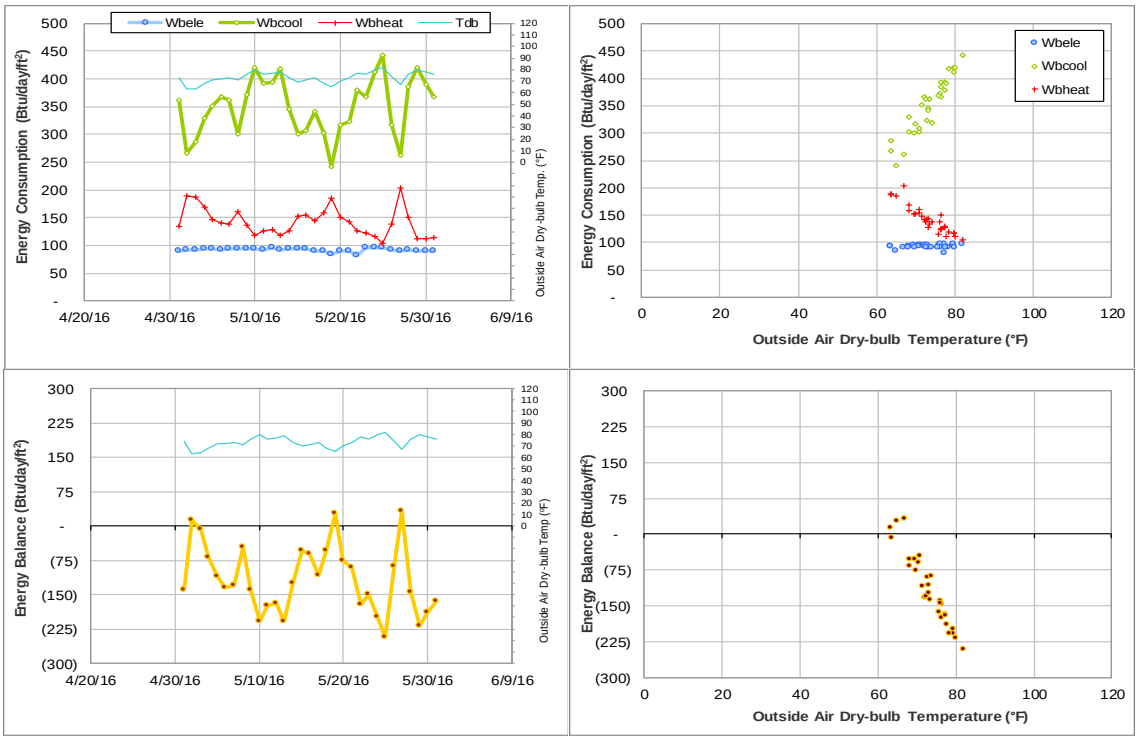


Figure IV-108 All Faiths Chapel TAMU BLDG # 512 Energy Balance Plot during May 2016

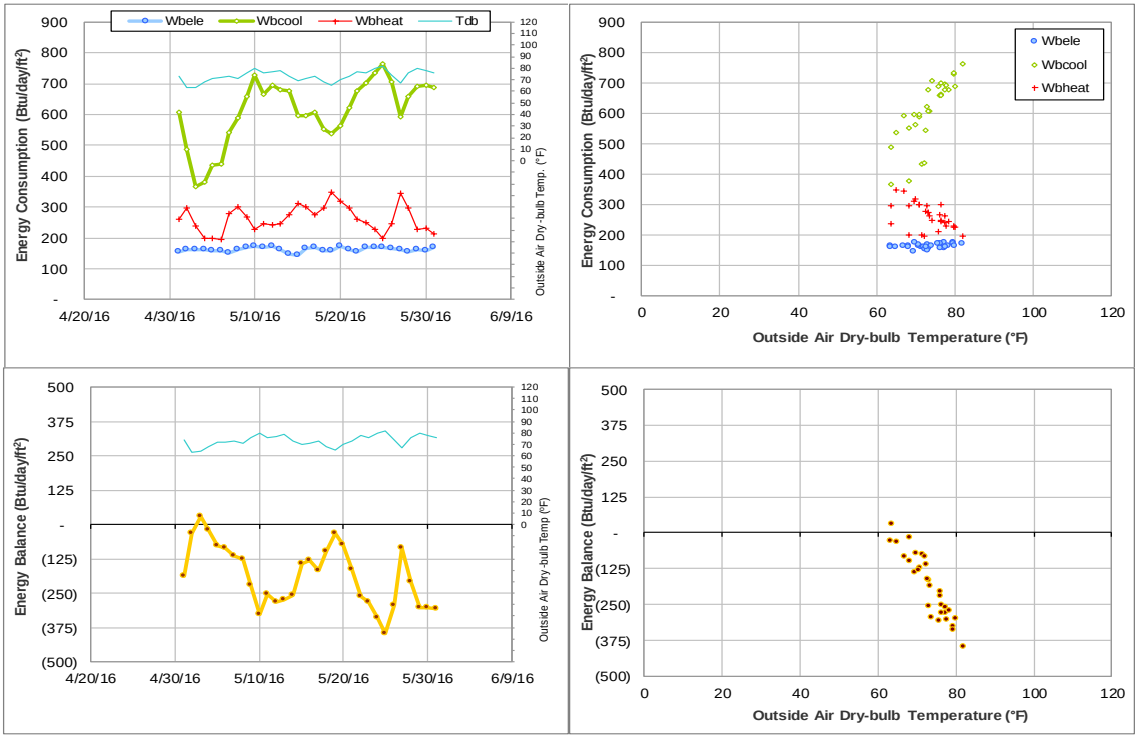


Figure IV-109 Doherty Building TAMU BLDG # 513 Energy Balance Plot during May 2016

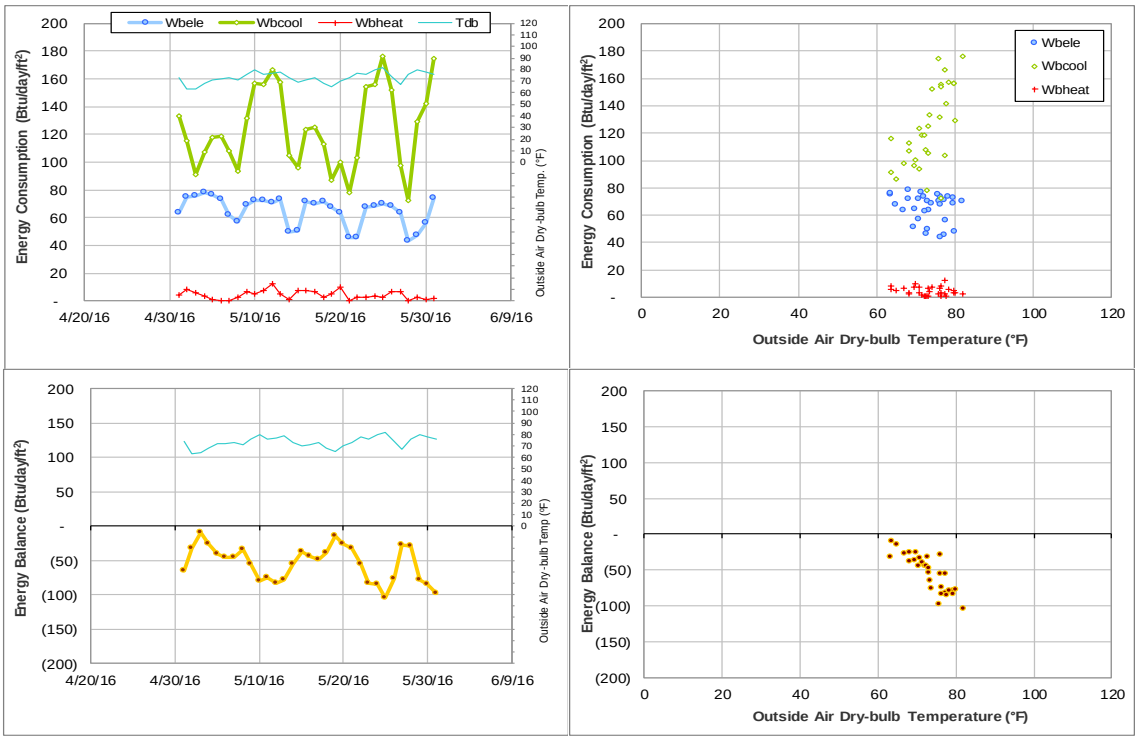


Figure IV-110 Munnerlyn Astronomy & Space Sciences Engineering TAMU BLDG # 514 Energy Balance Plot during May 2016

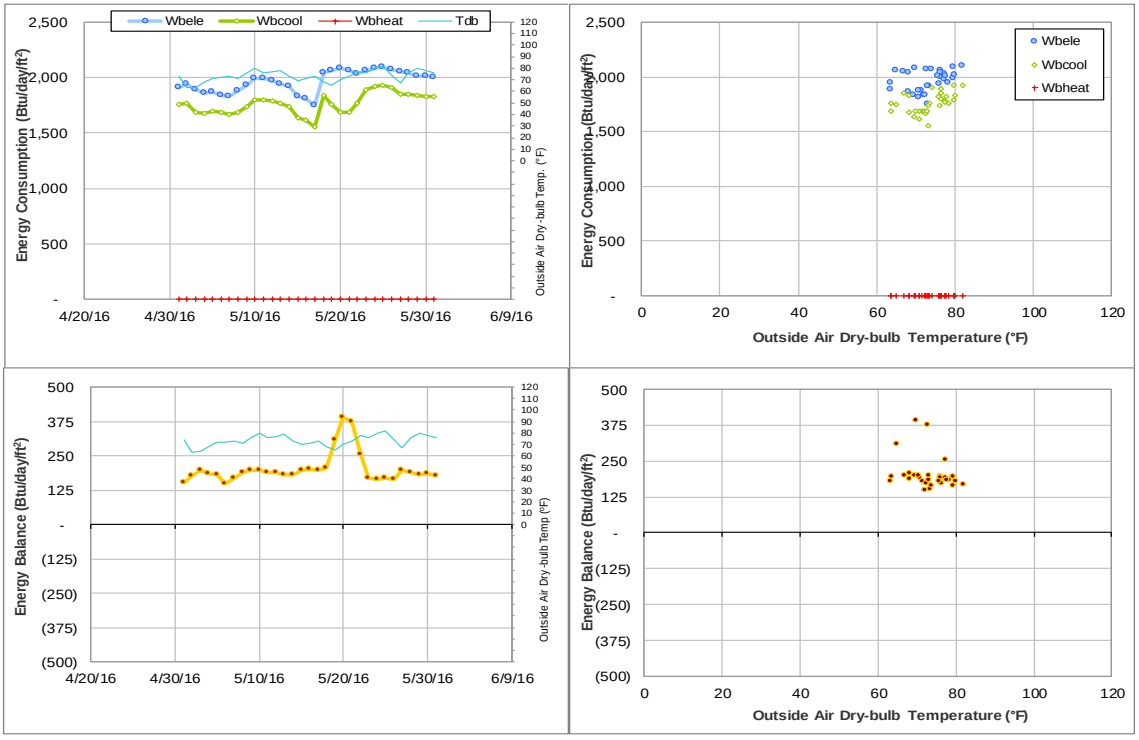


Figure IV-111 Computing Services Center TAMU BLDG # 516 Energy Balance Plot during May 2016

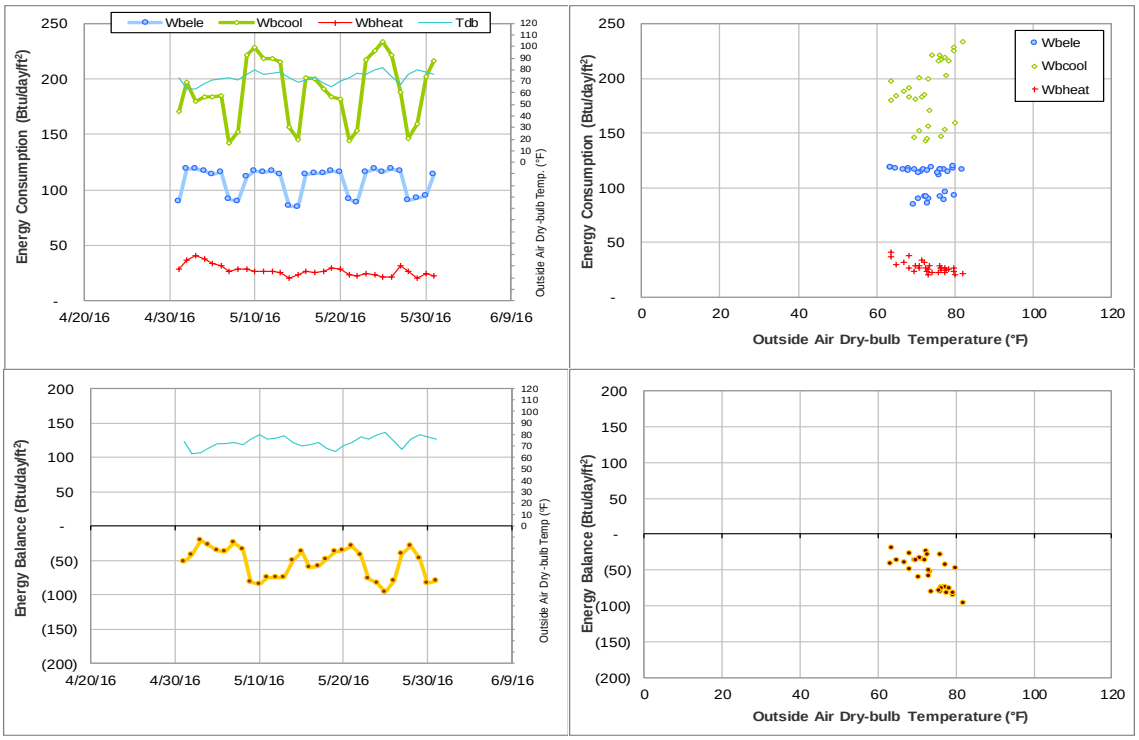


Figure IV-112 Beutel Health Center TAMU BLDG # 520 Energy Balance Plot during May 2016

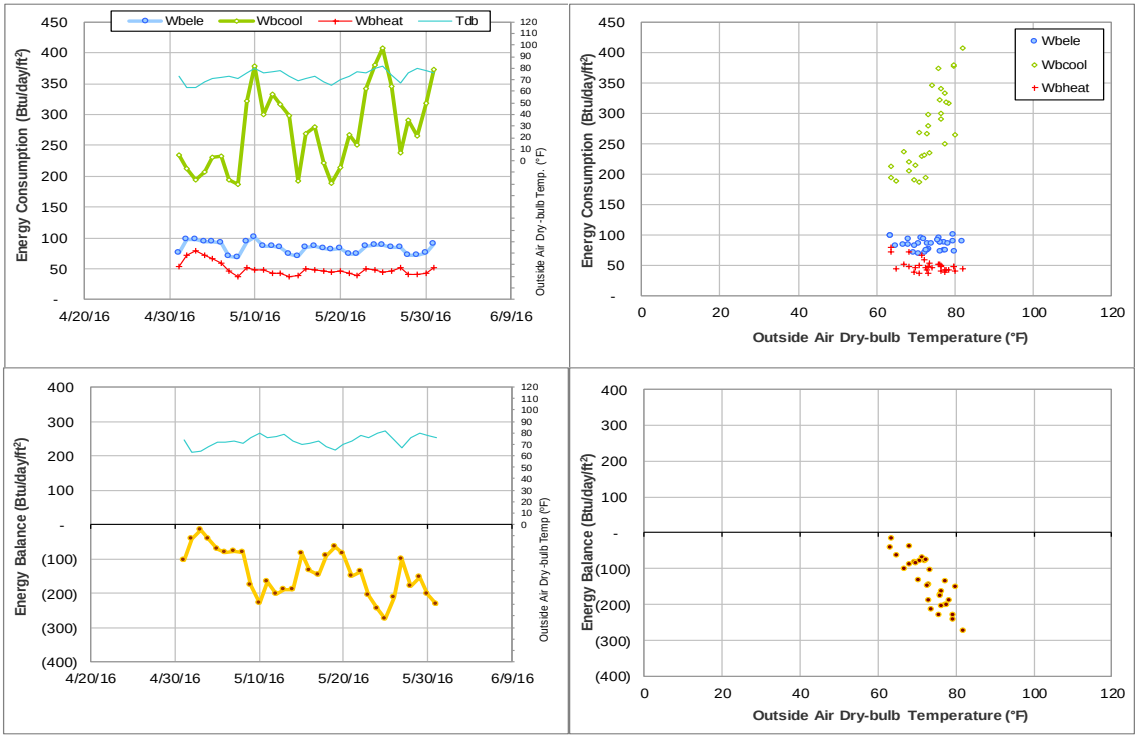


Figure IV-113 Heldenfels Hall TAMU BLDG # 521 Energy Balance Plot during May 2016

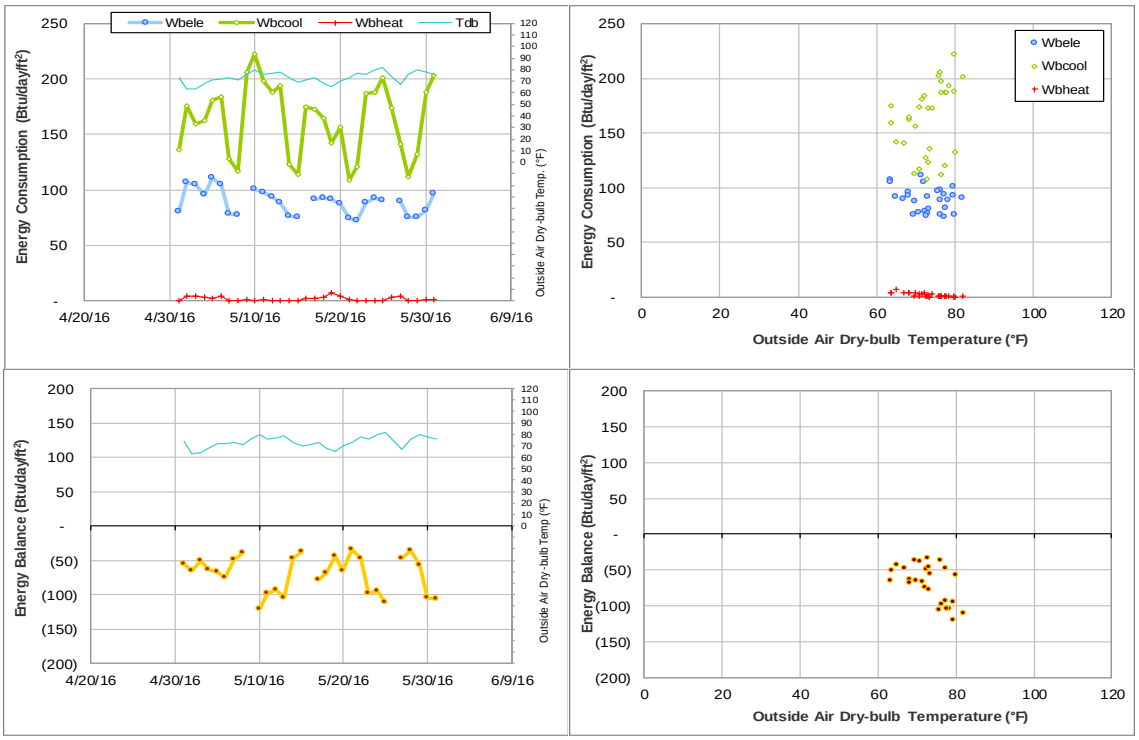


Figure IV-114 Blocker building TAMU BLDG # 524 Energy Balance Plot during May 2016

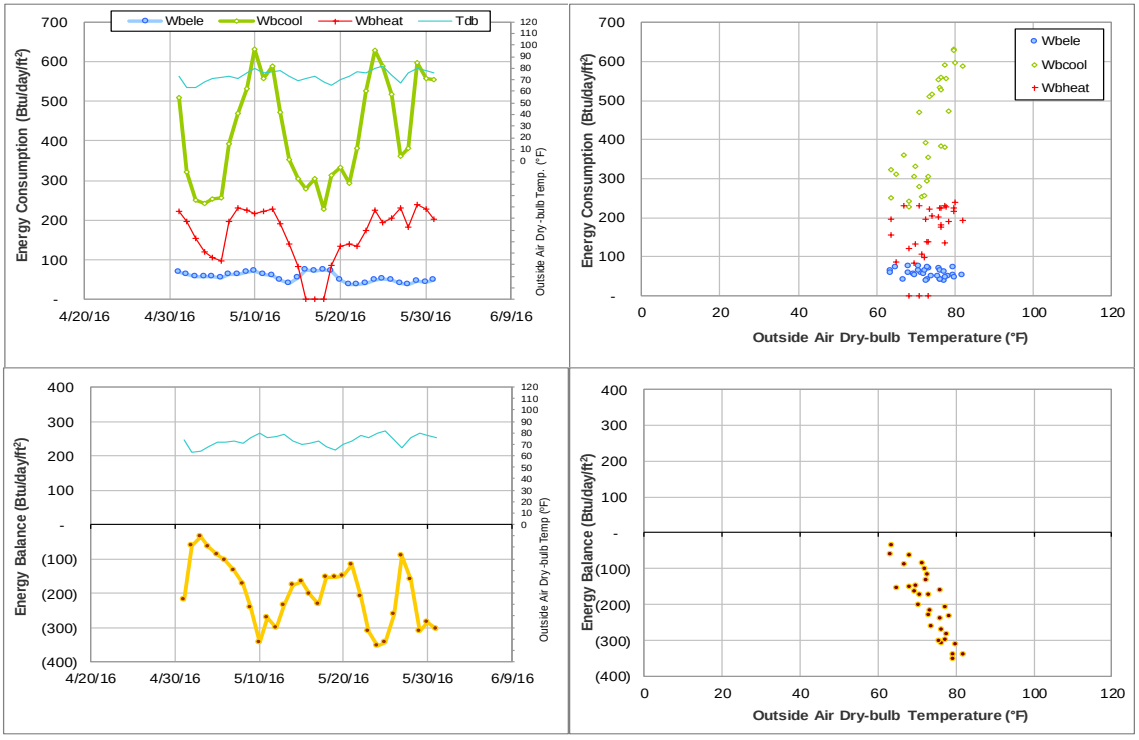


Figure IV-115 Clements Residence Hall TAMU BLDG # 548 Energy Balance Plot during May 2016

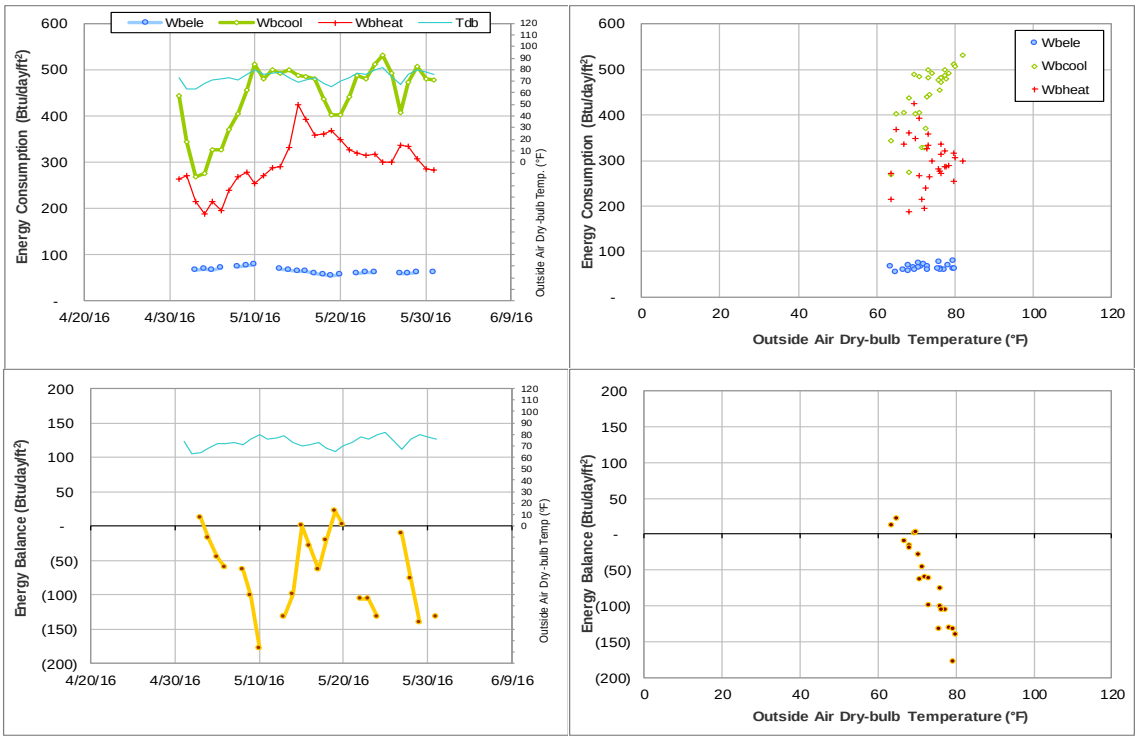


Figure IV-116 Haas Residence Hall TAMU BLDG # 549 Energy Balance Plot during May 2016

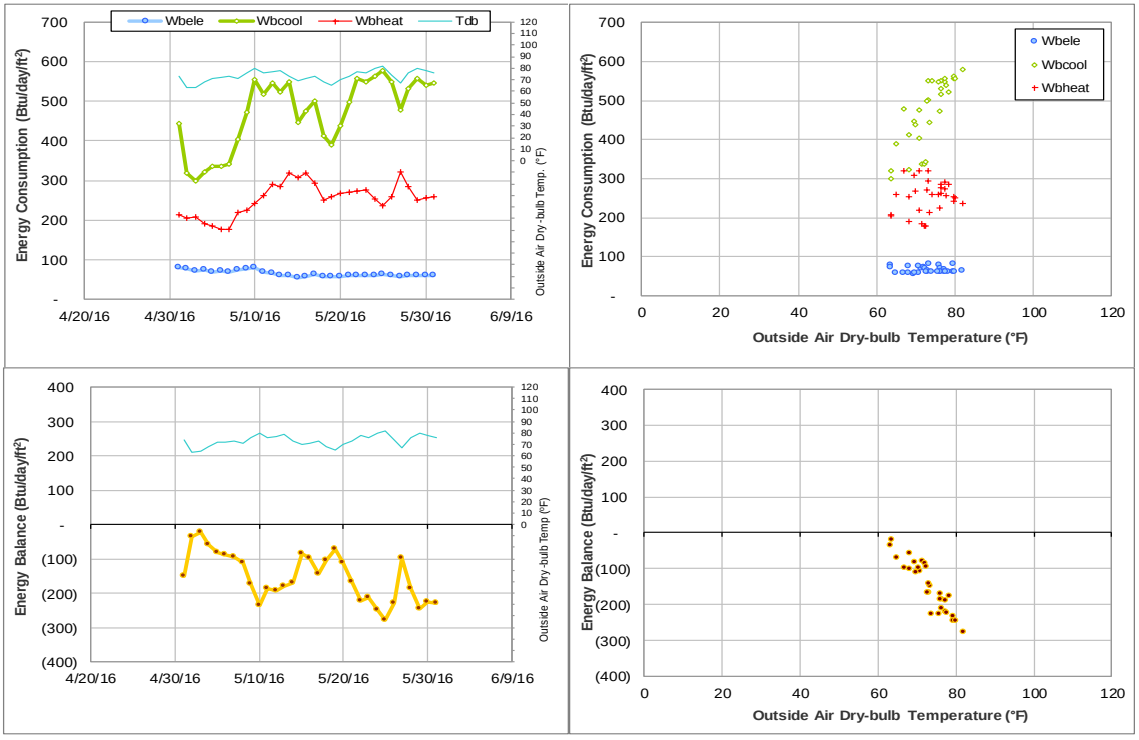


Figure IV-117 McFadden Residence Hall TAMU BLDG # 550 Energy Balance Plot during May 2016

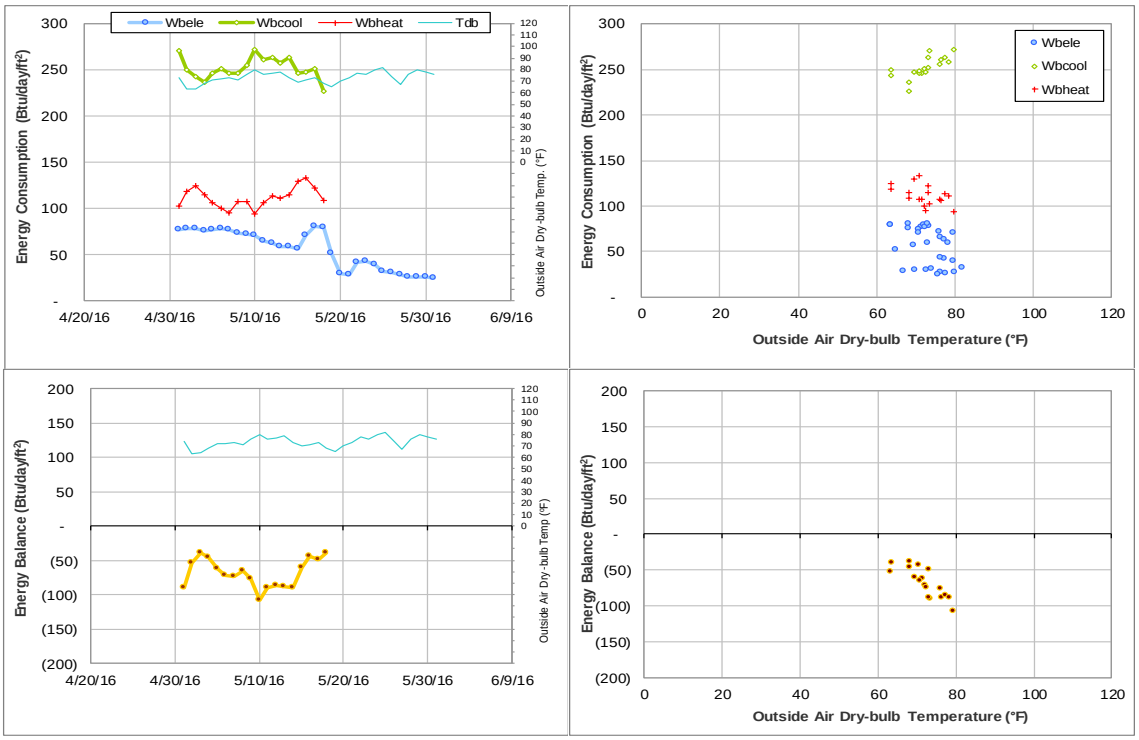


Figure IV-118 Neeley Residence Hall TAMU BLDG # 652 Energy Balance Plot during May 2016

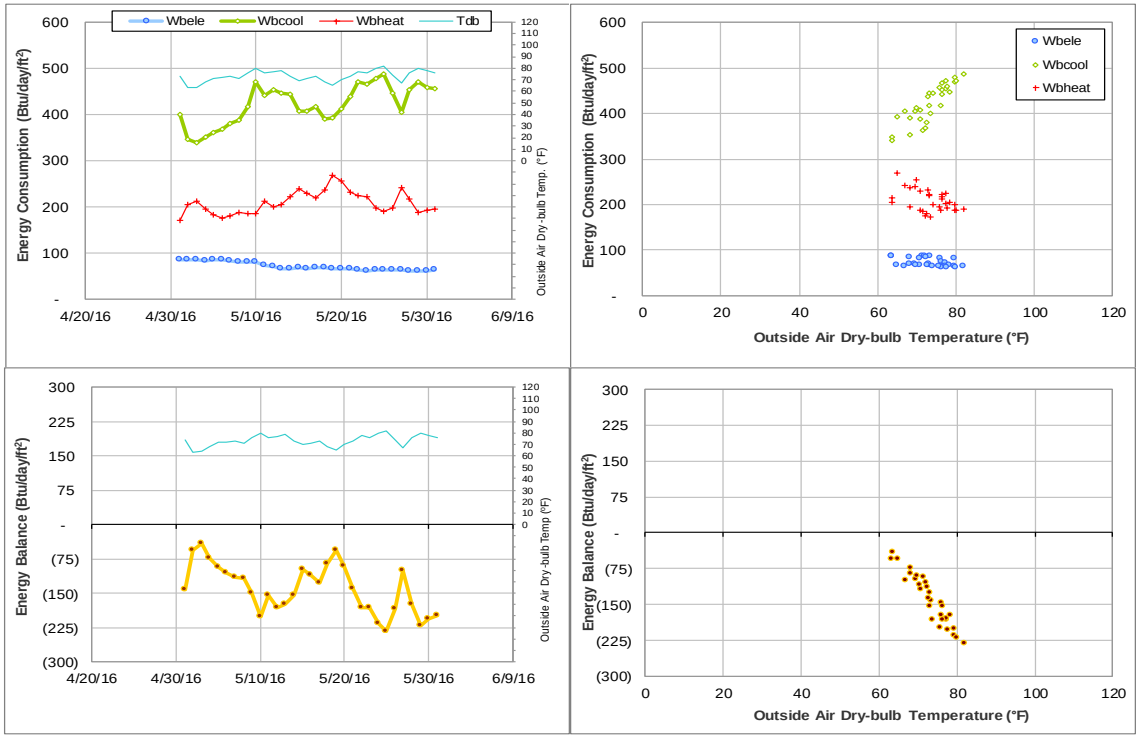


Figure IV-119 Hobby Residence Hall TAMU BLDG # 653 Energy Balance Plot during May 2016

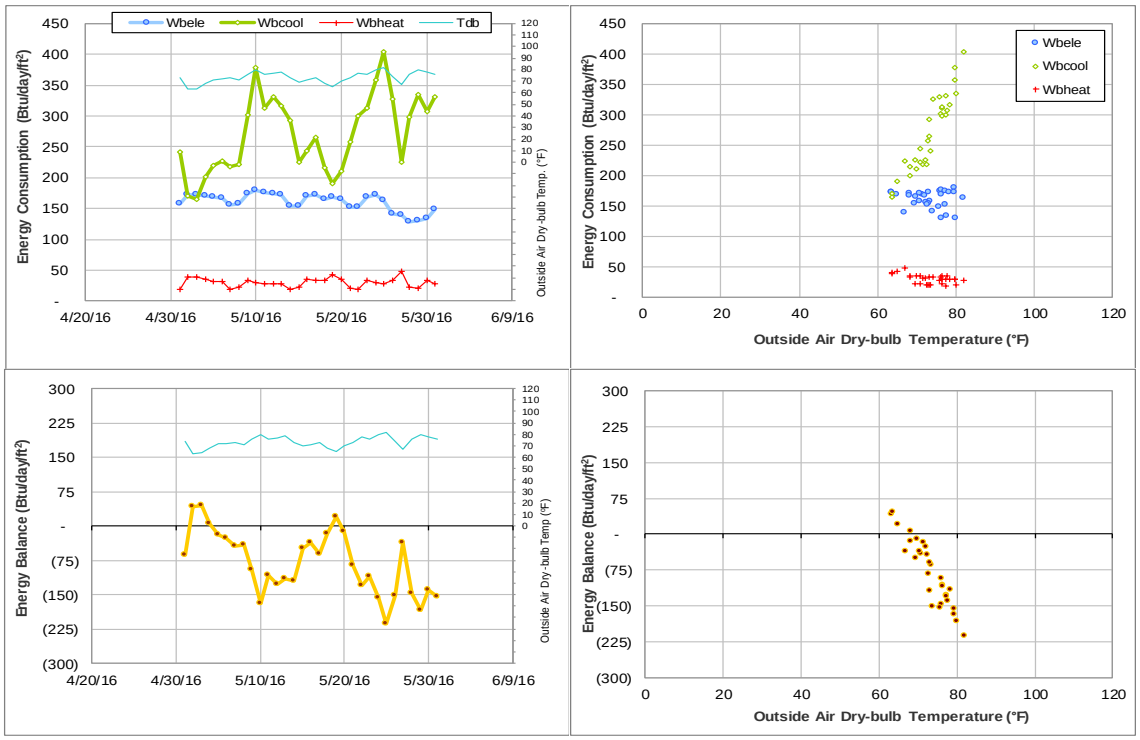


Figure IV-120 Wisenbaker Engineering Research Center TAMU BLDG # 682 Energy Balance Plot during May 2016

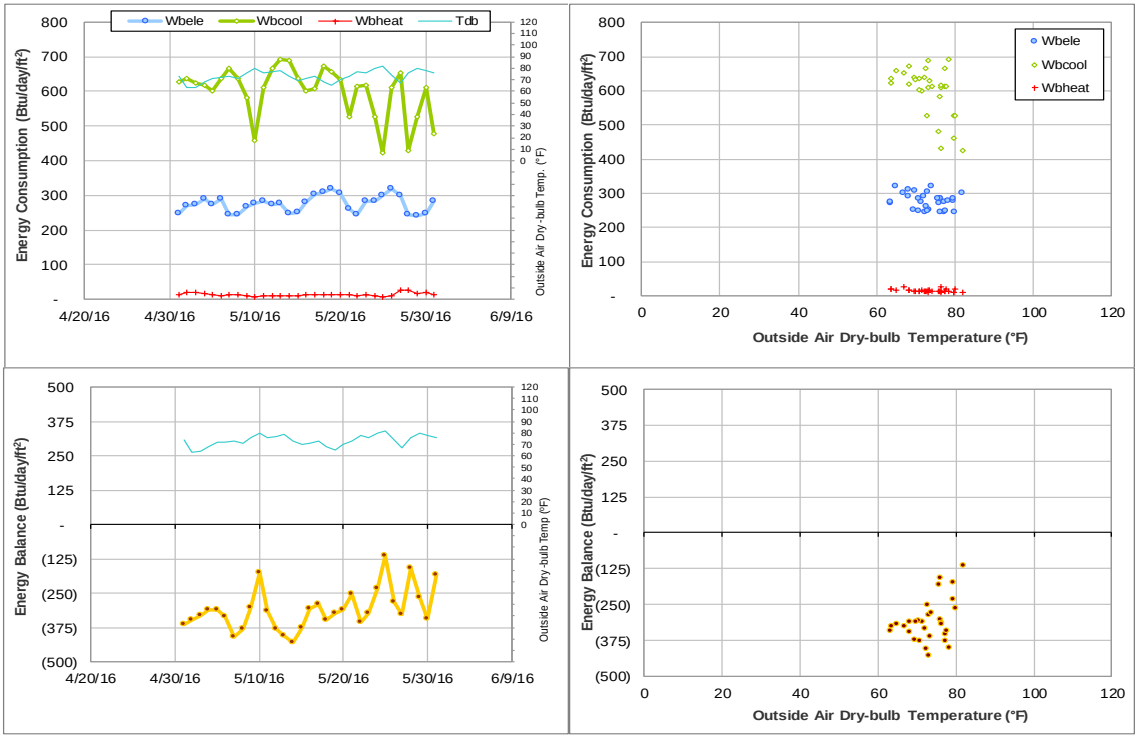


Figure IV-121 McNew Laboratory TAMU BLDG # 740 Energy Balance Plot during May 2016

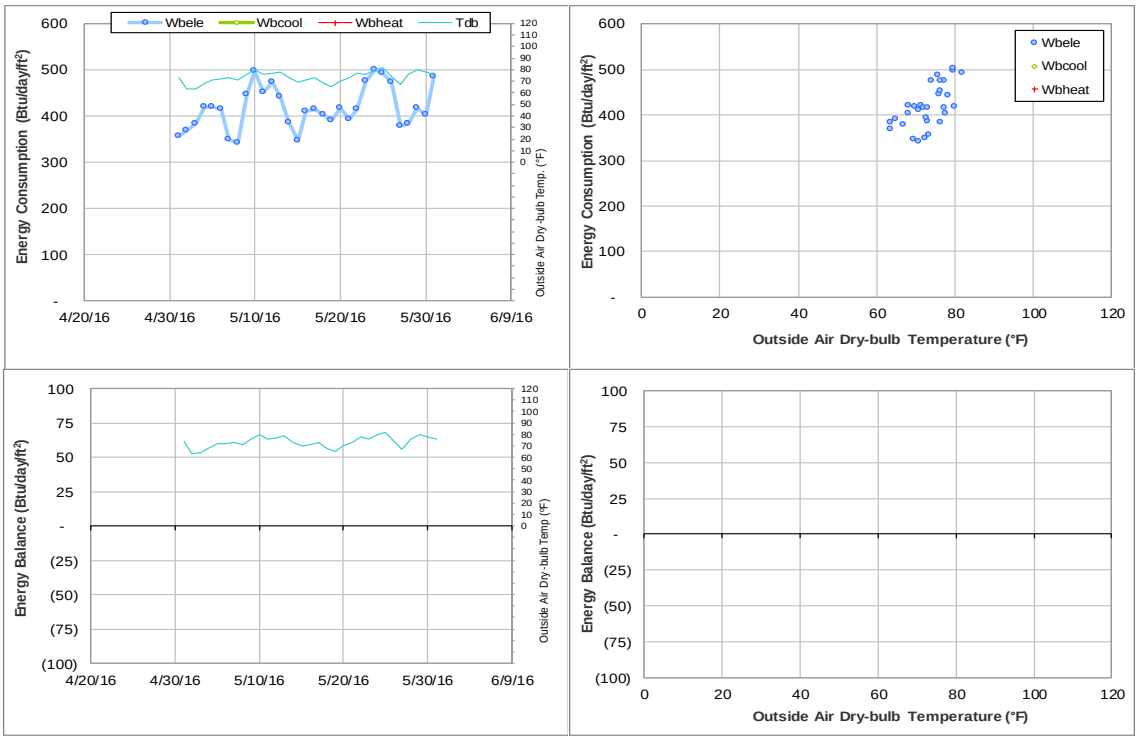


Figure IV-122 Soil Testing Labs TAMU BLDG # 806 Energy Balance Plot during May 2016

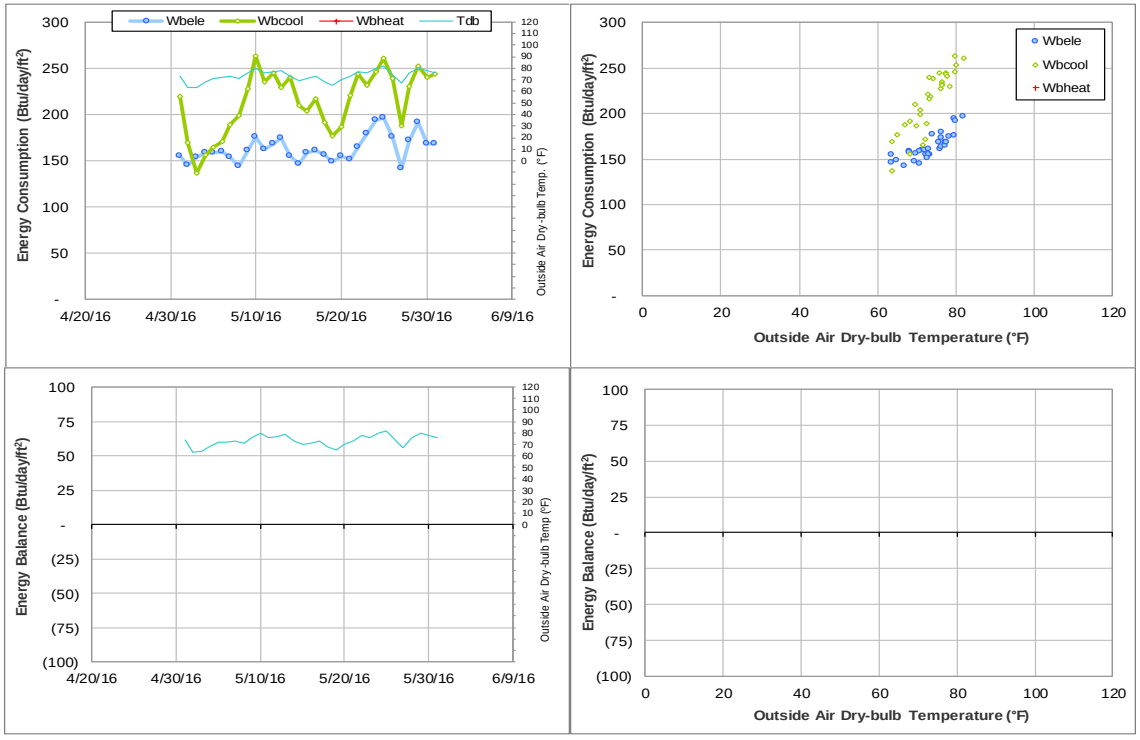


Figure IV-123 Entomology Research Lab TAMU BLDG # 815 Energy Balance Plot during May 2016

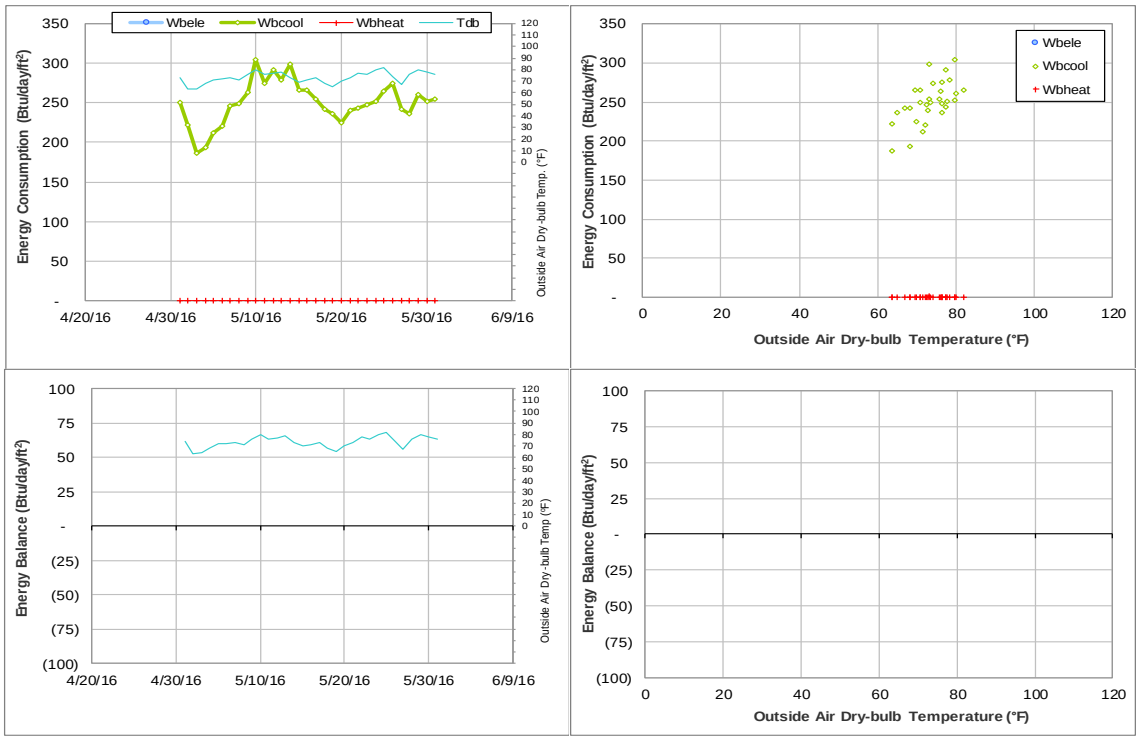


Figure IV-124 TVMC-Small Animal Building TAMU BLDG # 880 Energy Balance Plot during May 2016

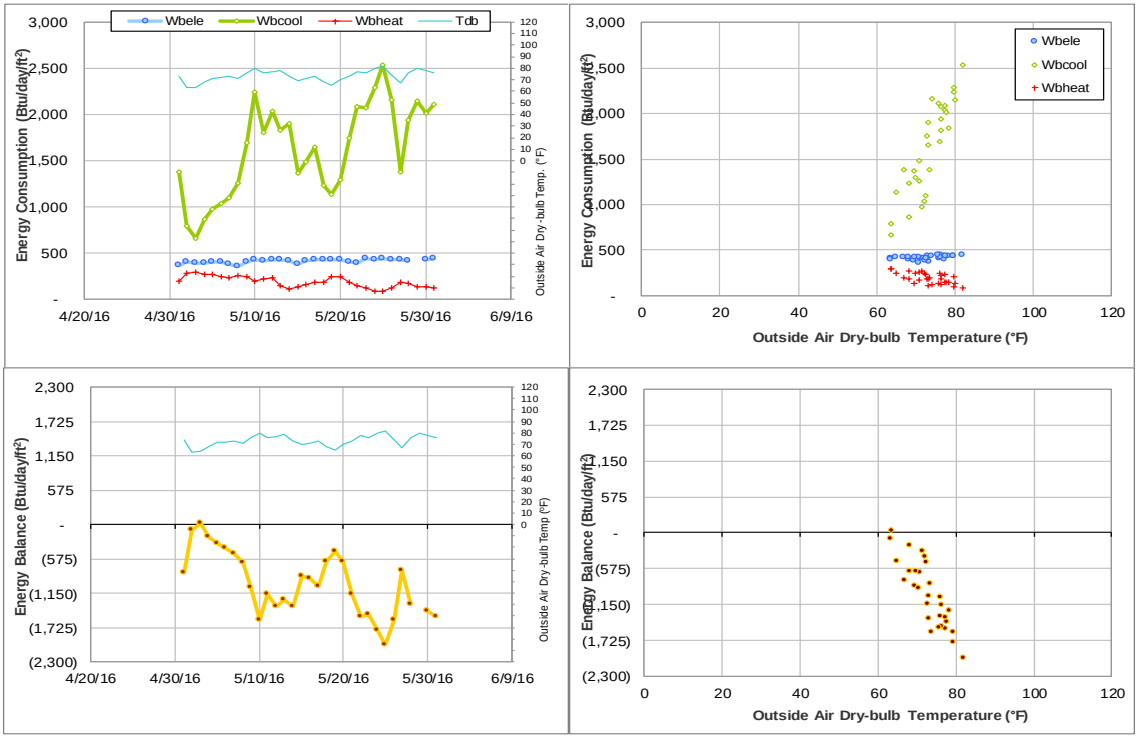


Figure IV-125 Laboratory Animal Care Building TAMU BLDG # 972 Energy Balance Plot during May 2016

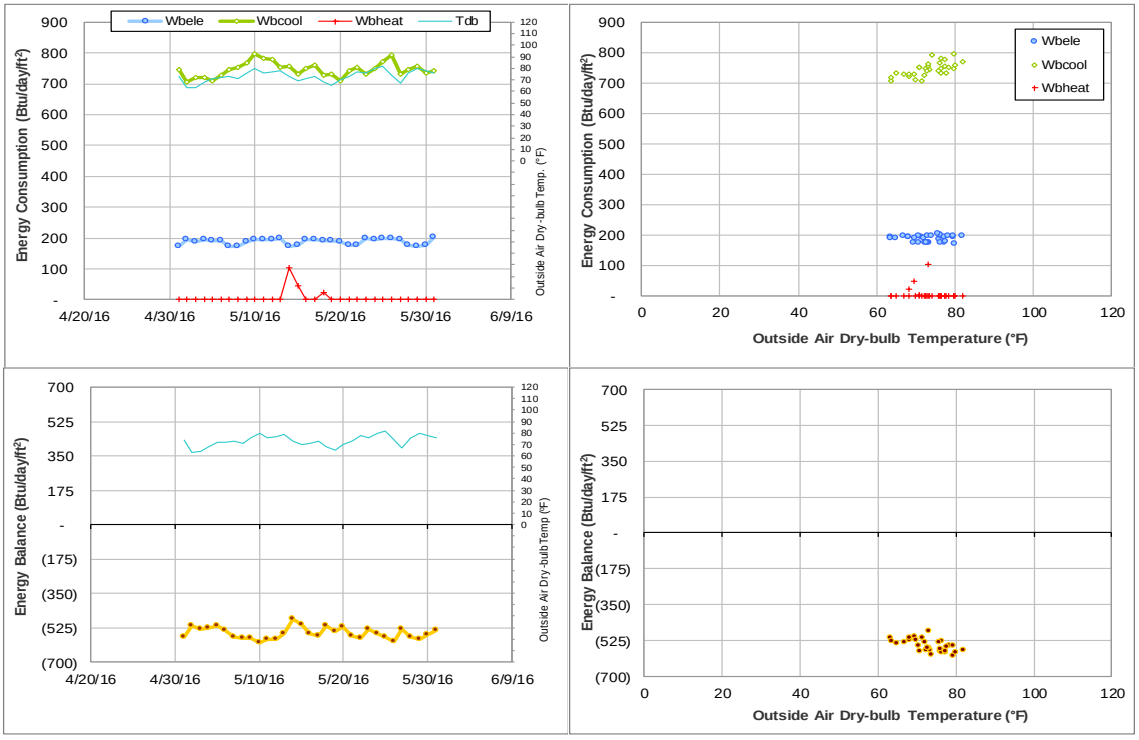


Figure IV-126 Vivarium III TAMU BLDG # 1020 Energy Balance Plot during May 2016

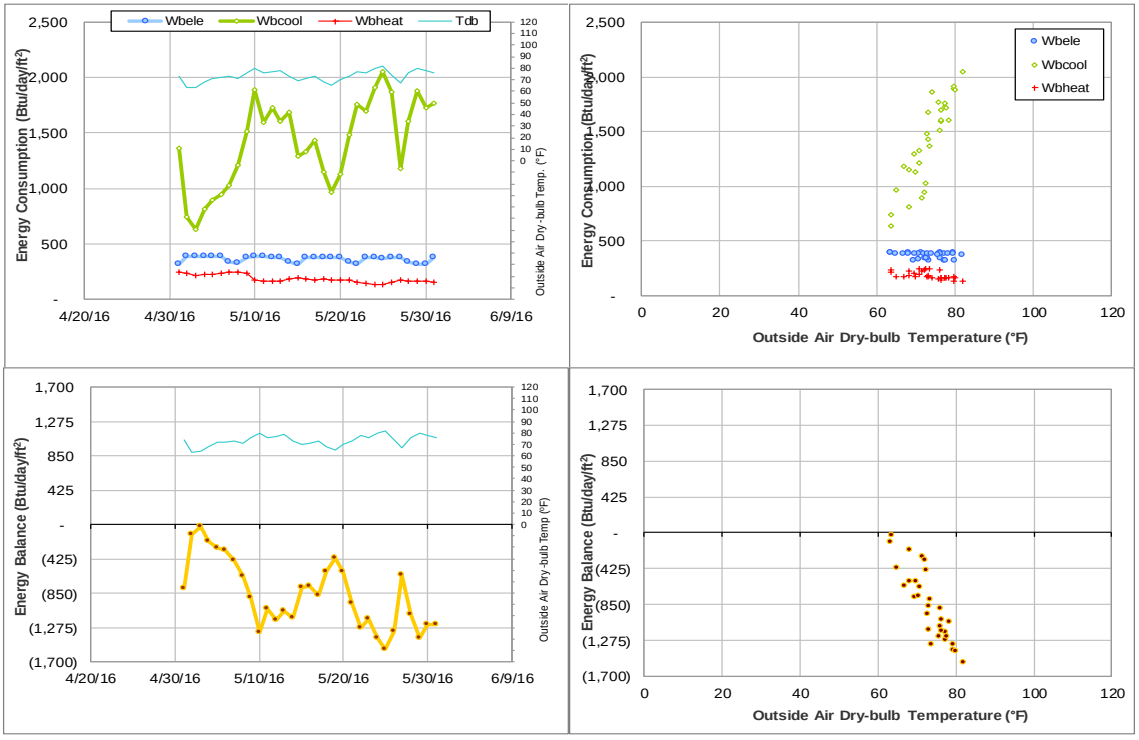


Figure IV-127 Texas Vet Med Diagnostic Lab TAMU BLDG # 1041 Energy Balance Plot during May 2016

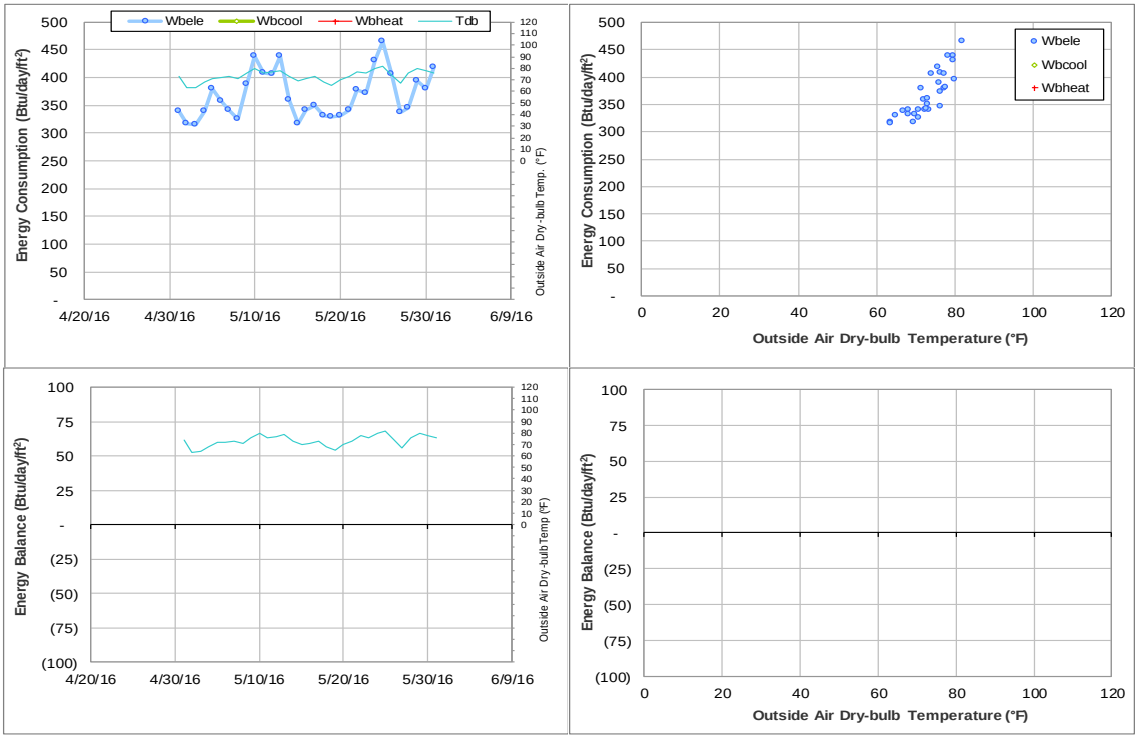


Figure IV-128 Forest Science Laboratory Building TAMU BLDG # 1042 Energy Balance Plot during May 2016

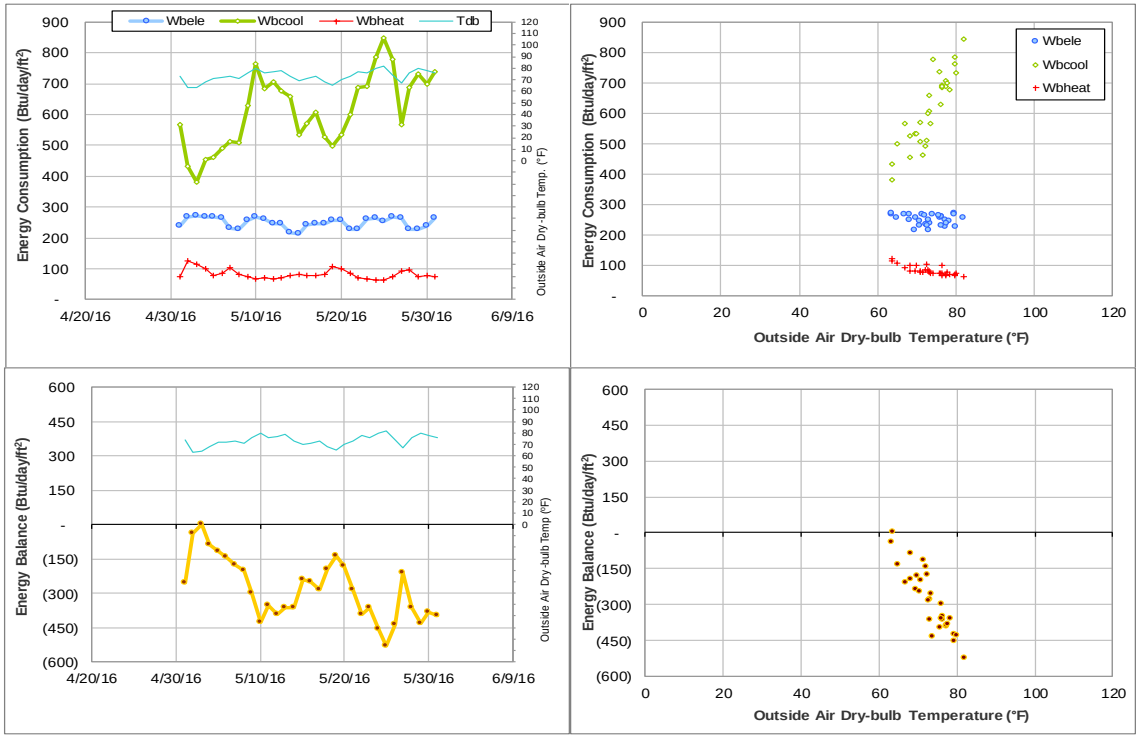


Figure IV-129 Veterinary Small Animal Hospital TAMU BLDG # 1085 Energy Balance Plot during May 2016

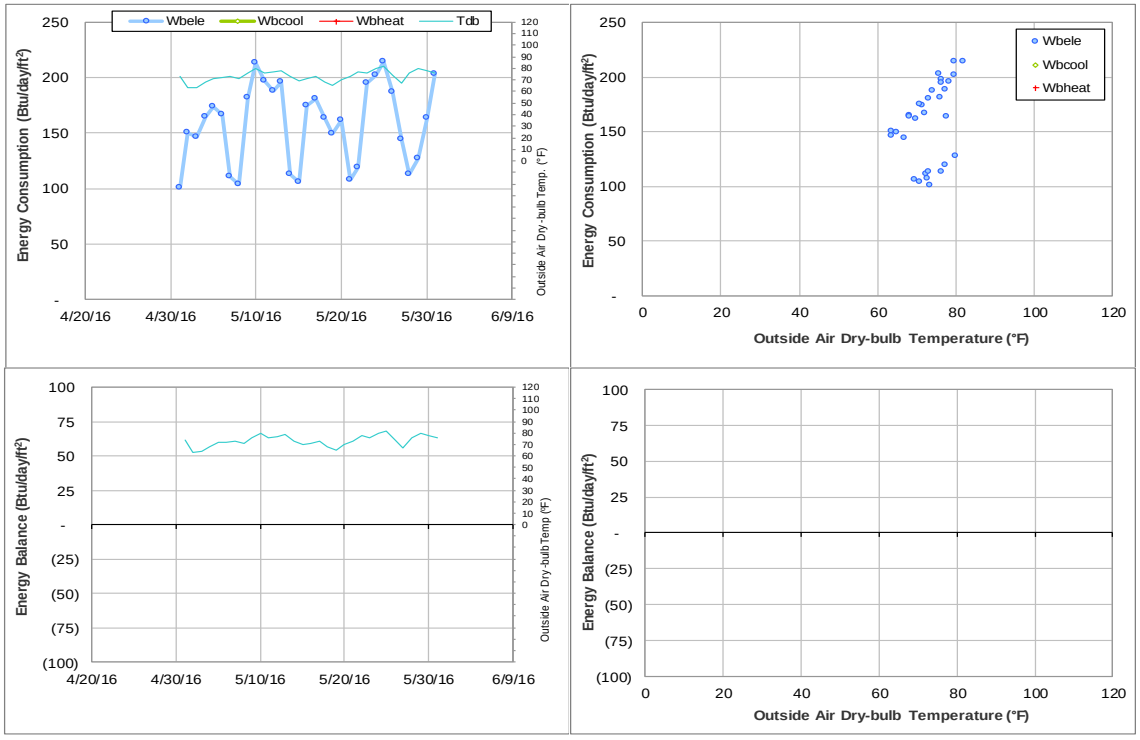


Figure IV-130 Utilities Energy Office Annex TAMU BLDG # 1089 Energy Balance Plot during May 2016

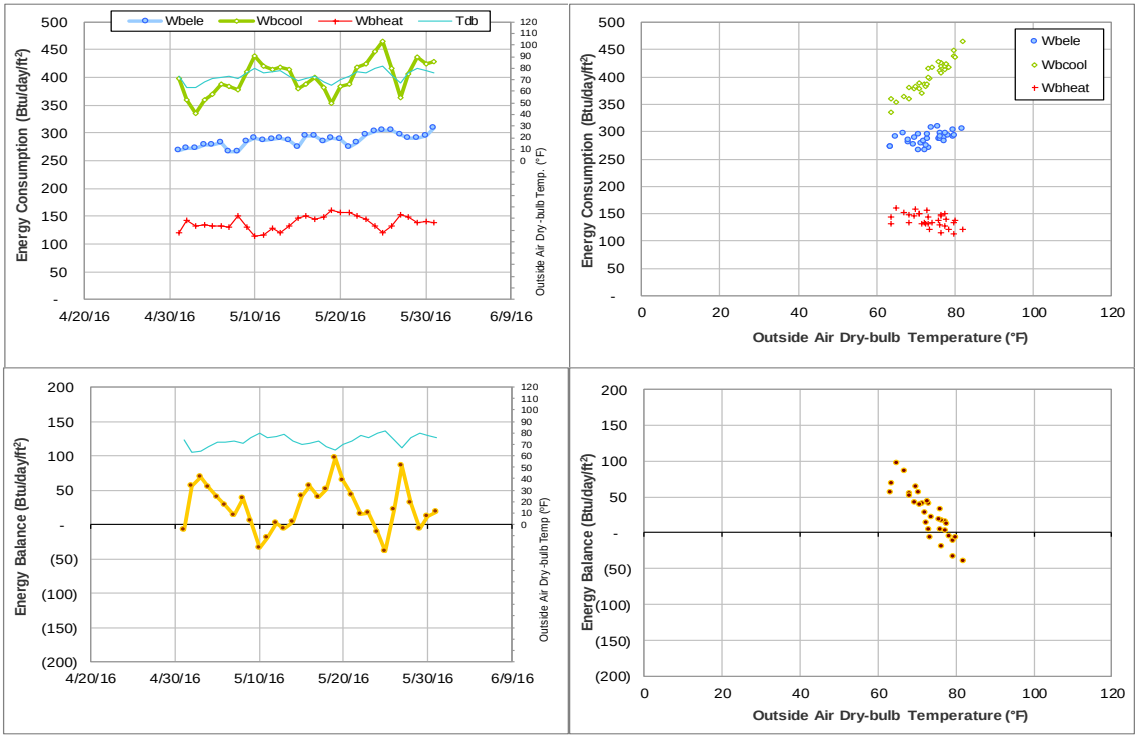


Figure IV-131 Biological Control Facility TAMU BLDG # 1146 Energy Balance Plot during May 2016

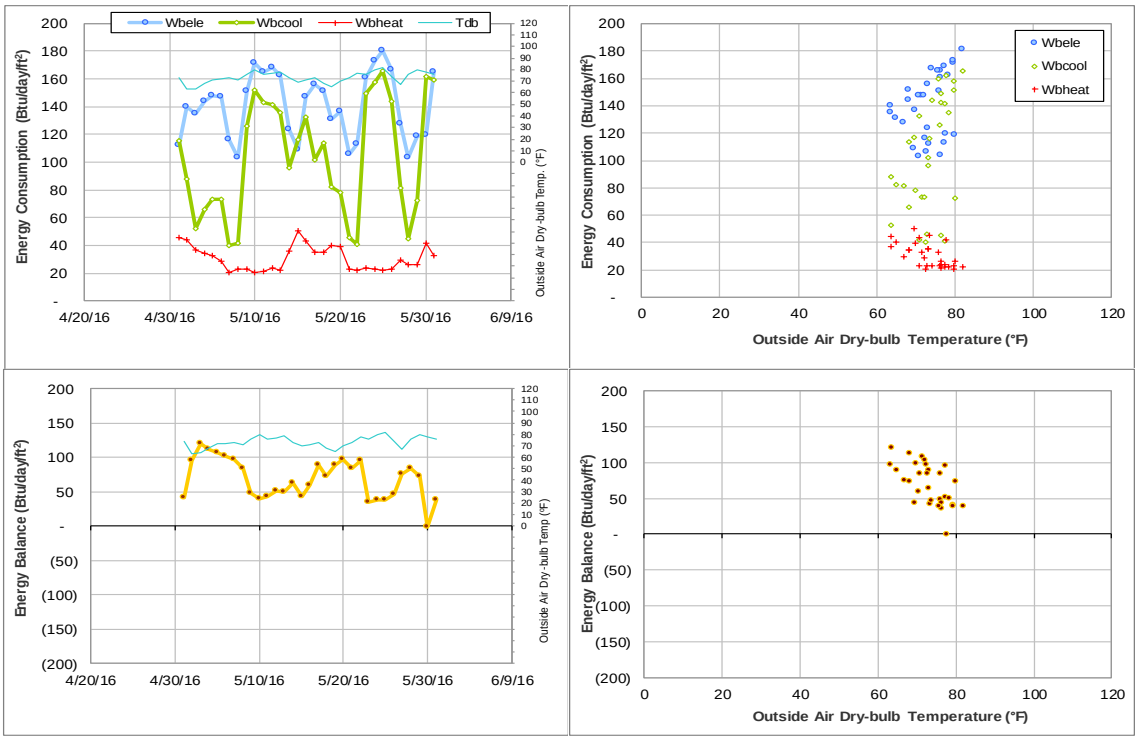


Figure IV-132 Physical Plant Administration & Shops TAMU BLDG # 1156 Energy Balance Plot during May 2016

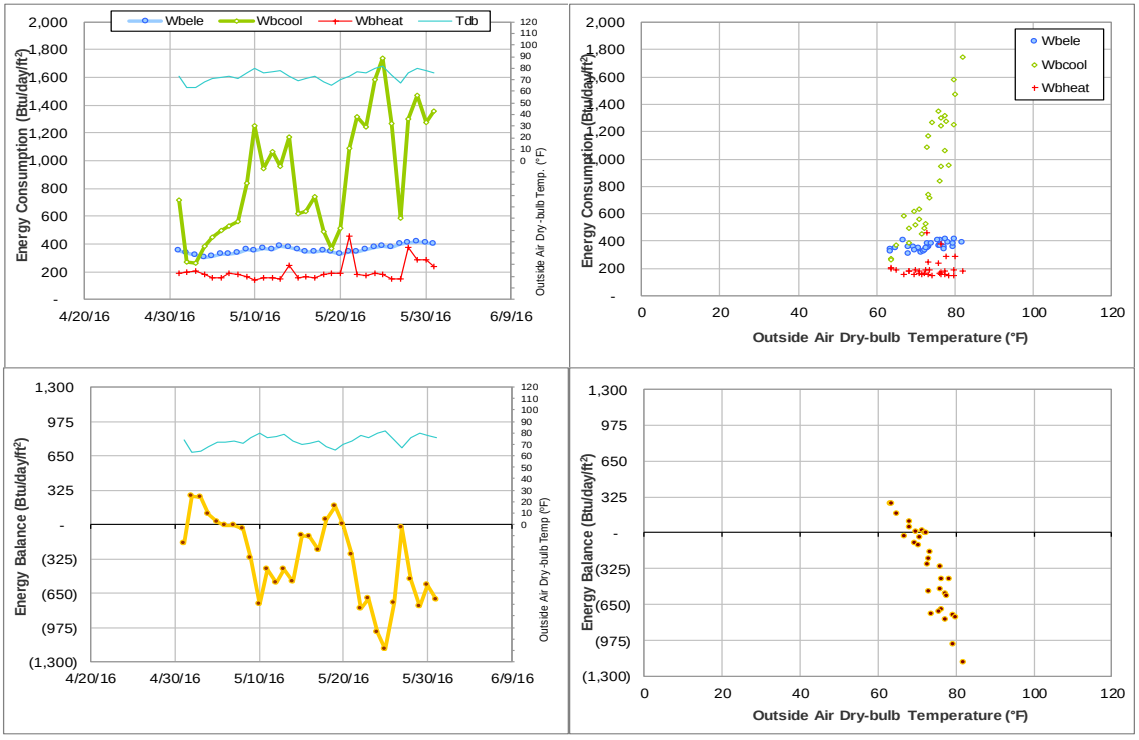


Figure IV-133 Veterinary Anatomic Pathology TAMU BLDG # 1184 Energy Balance Plot during May 2016

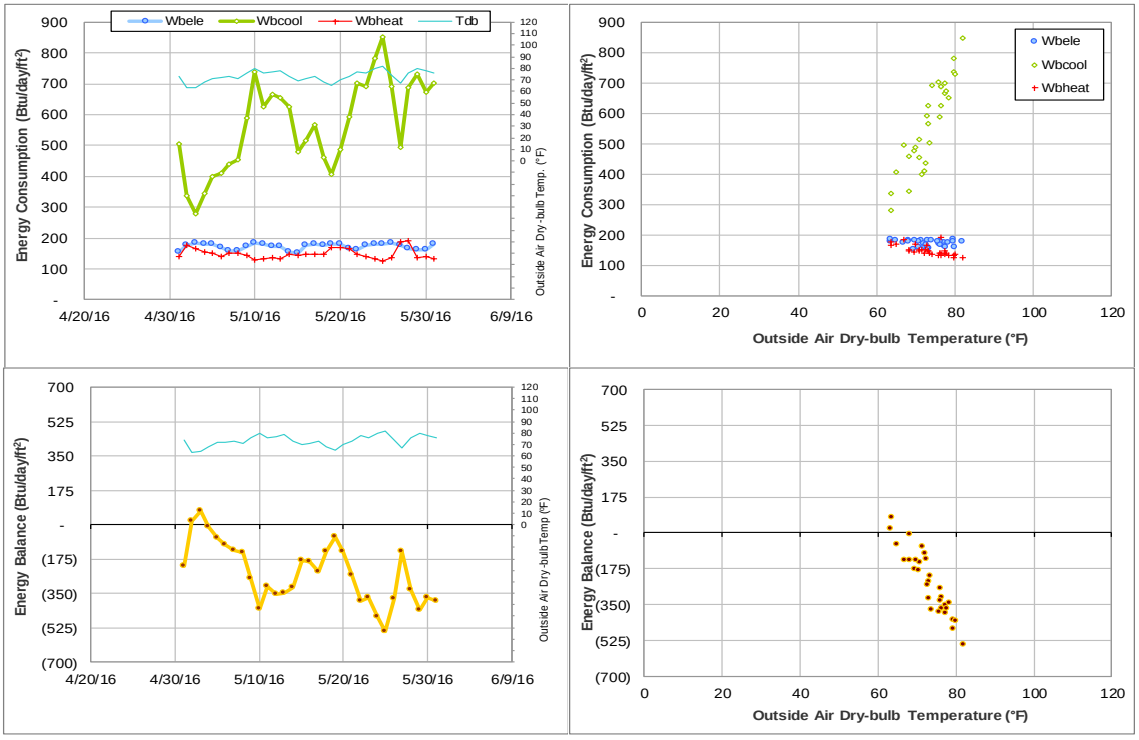


Figure IV-134 Veterinary Large Animal Hospital TAMU BLDG # 1194 Energy Balance Plot during May 2016

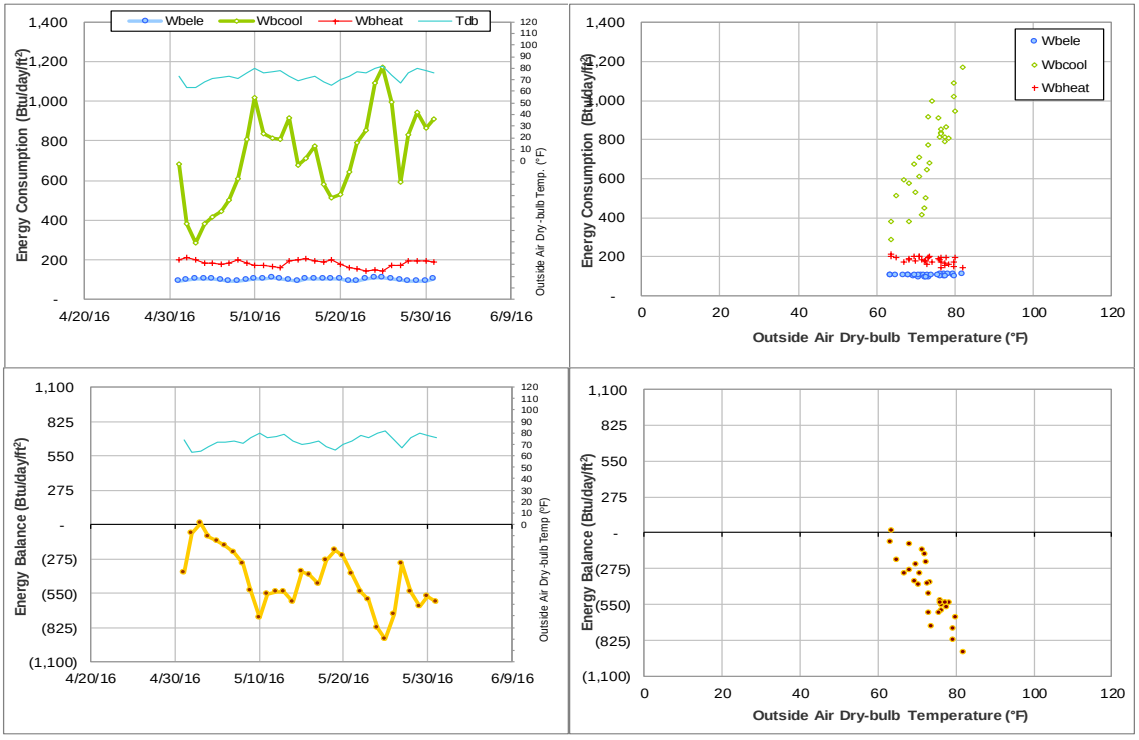


Figure IV-135 Veterinary Research Building TAMU BLDG # 1197 Energy Balance Plot during May 2016

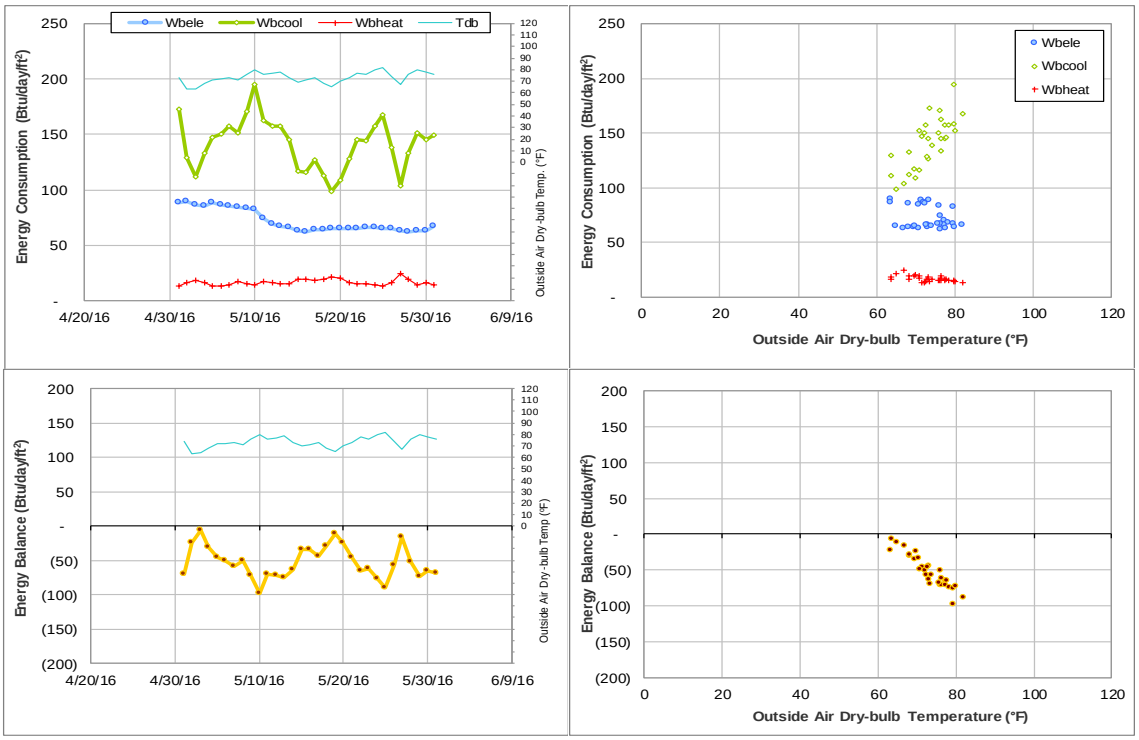


Figure IV-136 Hullabaloo Residence Hall TAMU BLDG # 1416 Energy Balance Plot during May 2016

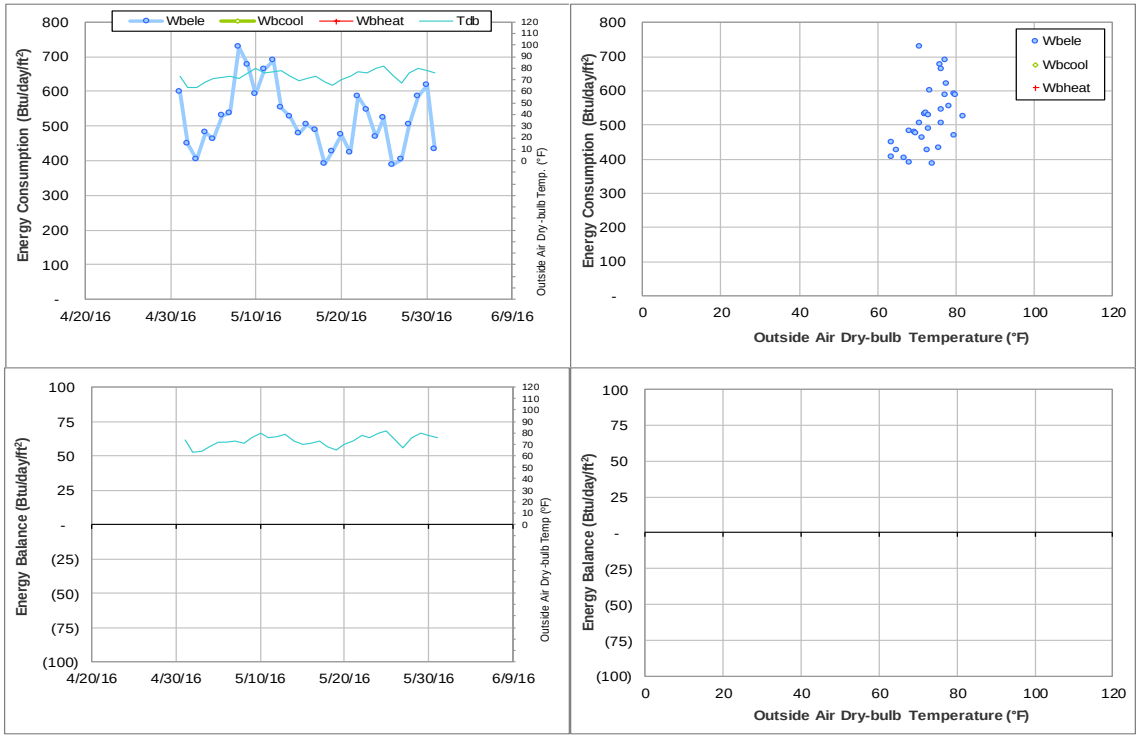


Figure IV-137 University Apartments - Laundry at the Gardens TAMU BLDG # 1450 Energy Balance Plot during May 2016

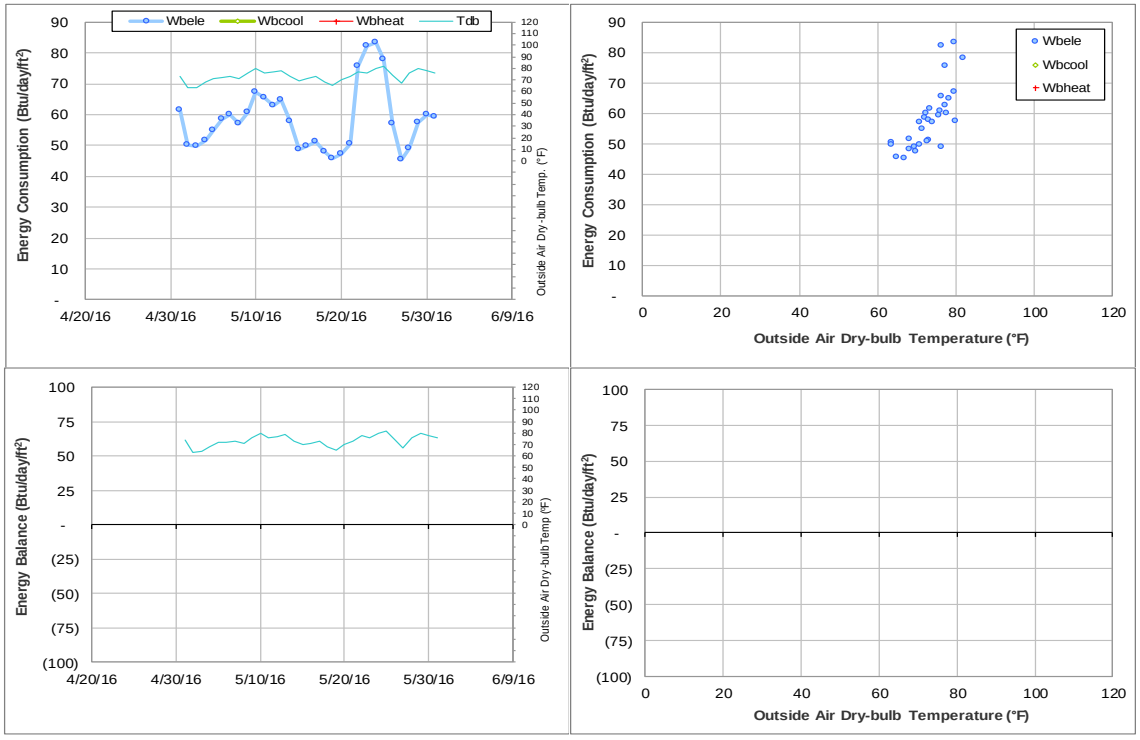


Figure IV-138 University Apartments - The Gardens J TAMU BLDG # 1451 Energy Balance Plot during May 2016

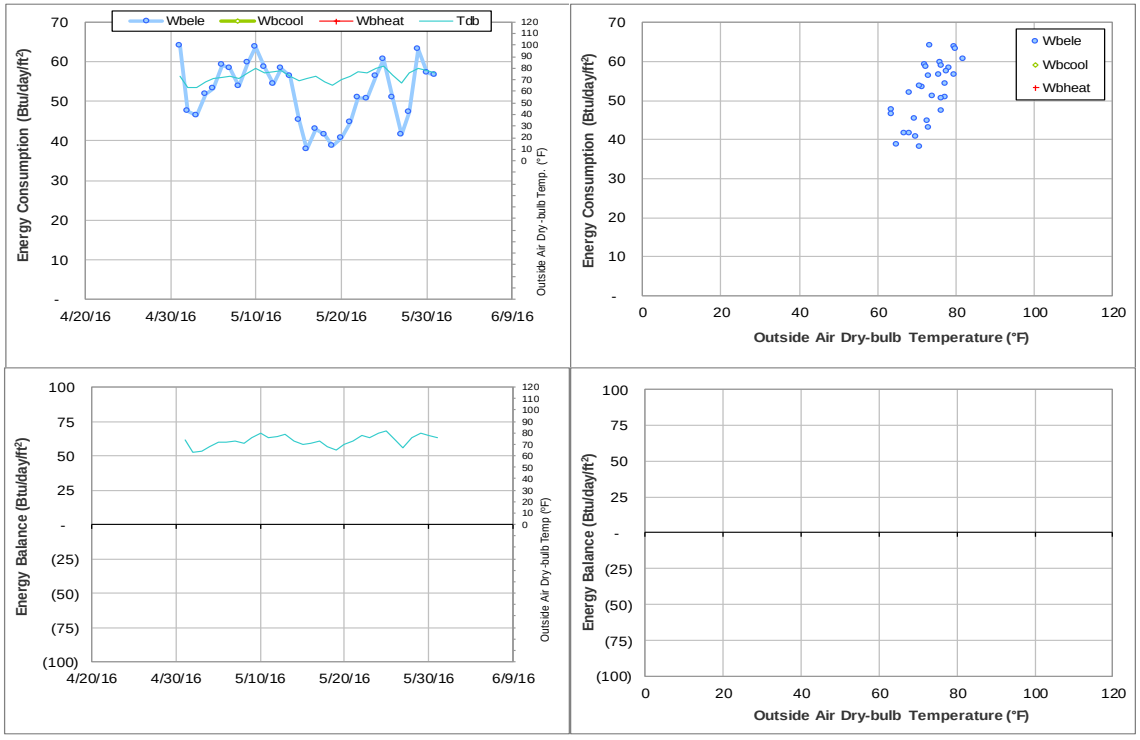


Figure IV-139 University Apartments - The Gardens L TAMU BLDG # 1453 Energy Balance Plot during May 2016

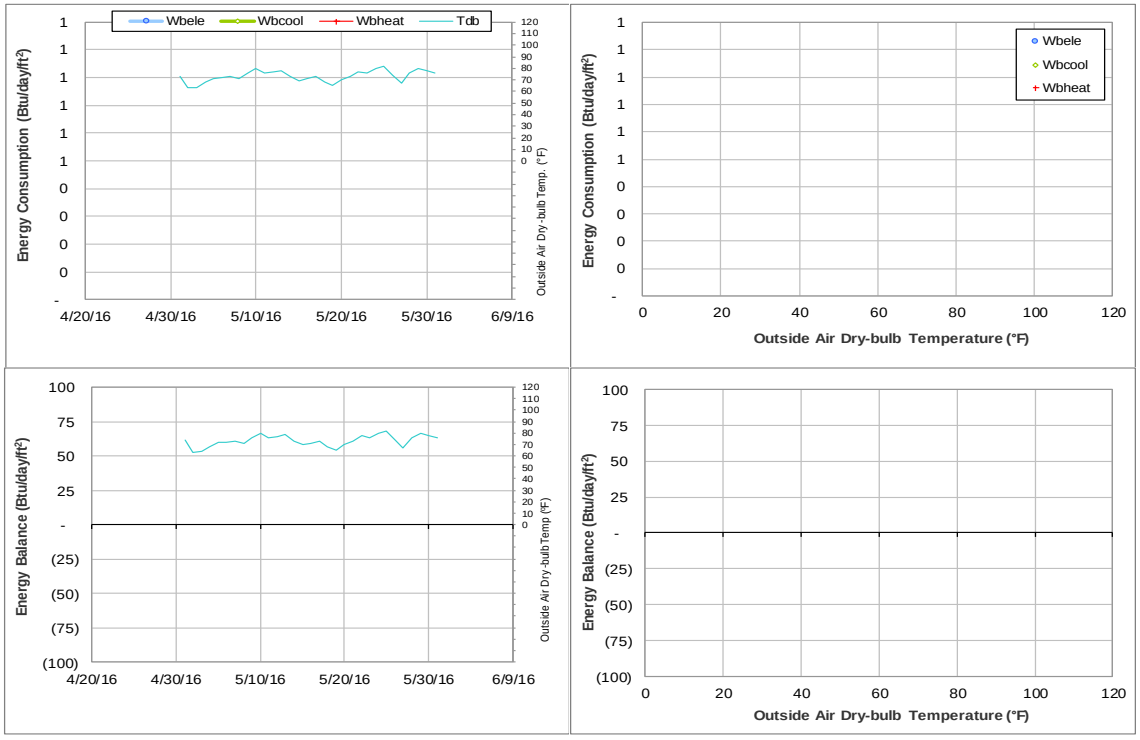


Figure IV-140 University Apartments - The Gardens F TAMU BLDG # 1454 Energy Balance Plot during May 2016

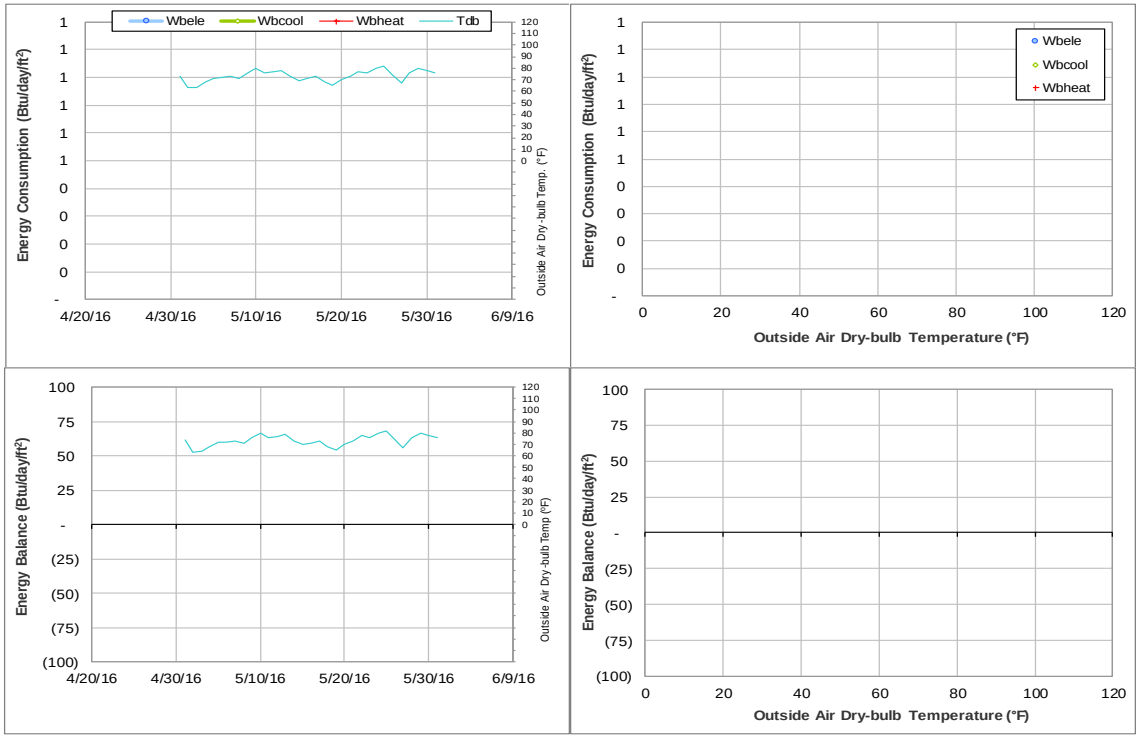


Figure IV-141 University Apartments - The Gardens G TAMU BLDG # 1455 Energy Balance Plot during May 2016

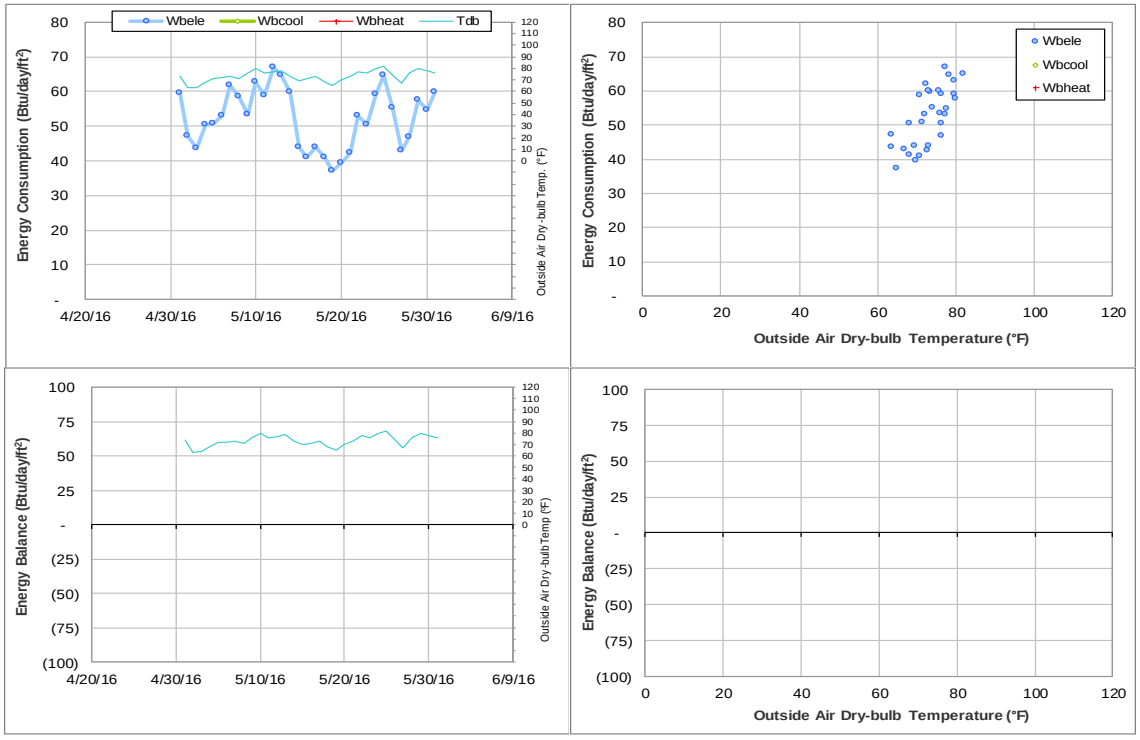


Figure IV-142 University Apartments - The Gardens H TAMU BLDG # 1456 Energy Balance Plot during May 2016

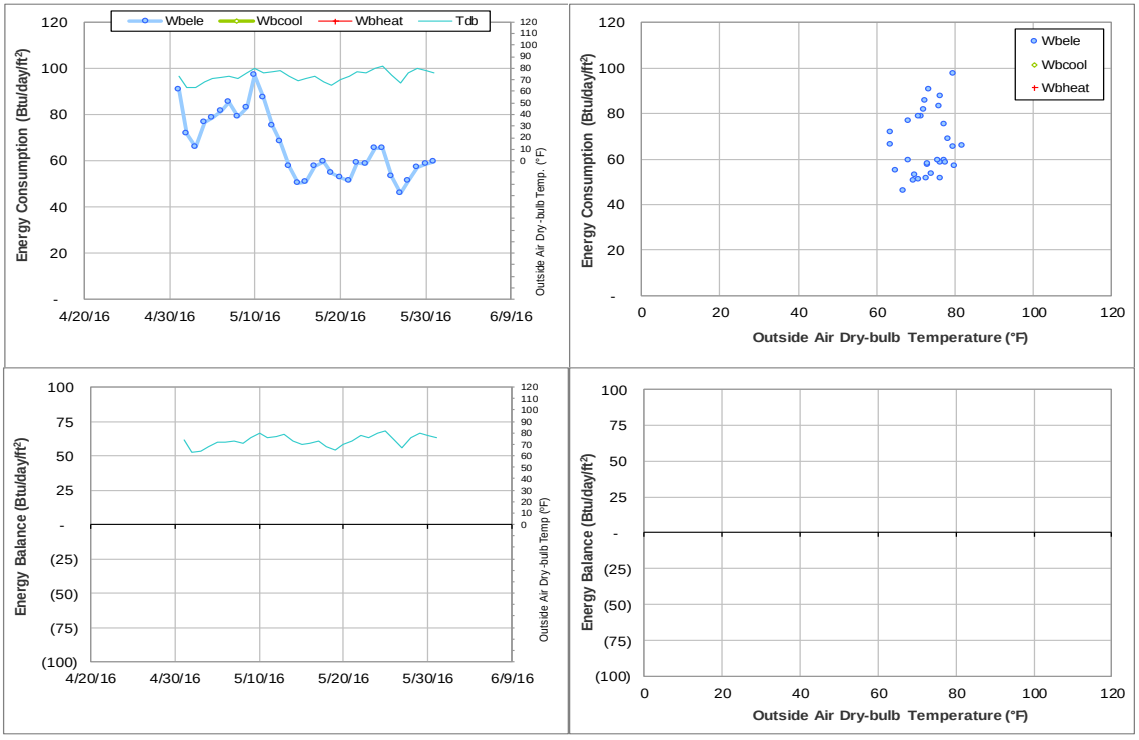


Figure IV-143 University Apartments - The Gardens M TAMU BLDG # 1457 Energy Balance Plot during May 2016

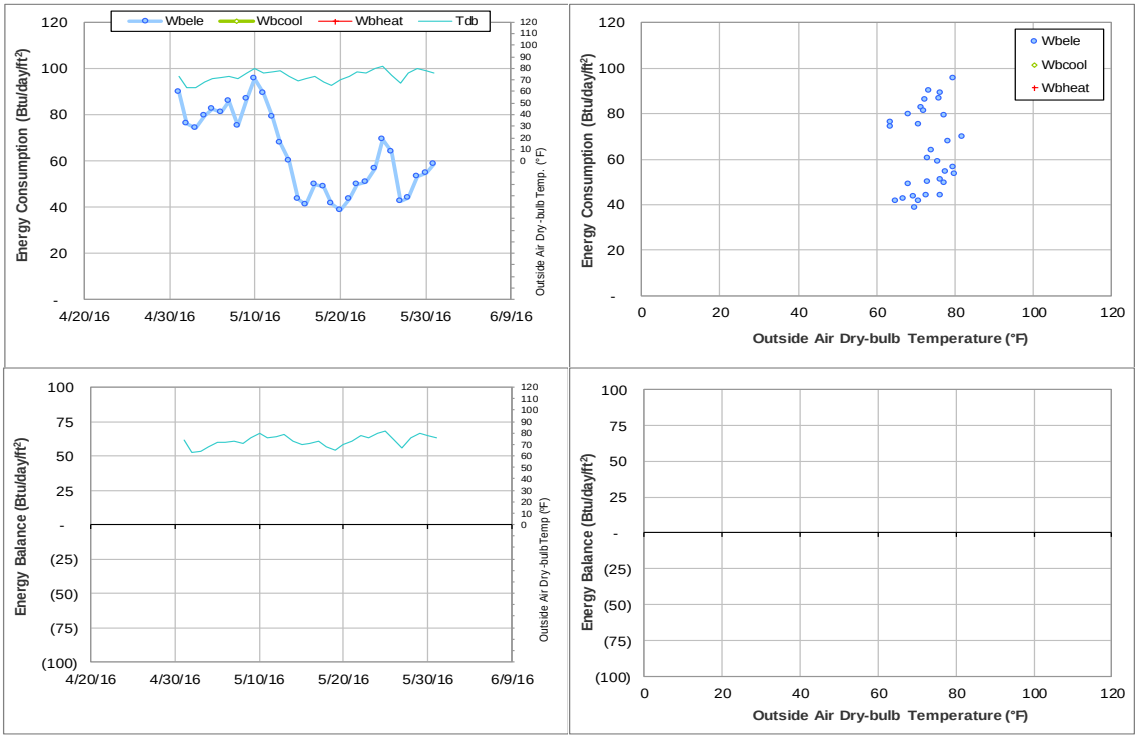


Figure IV-144 University Apartments - The Gardens N TAMU BLDG # 1458 Energy Balance Plot during May 2016

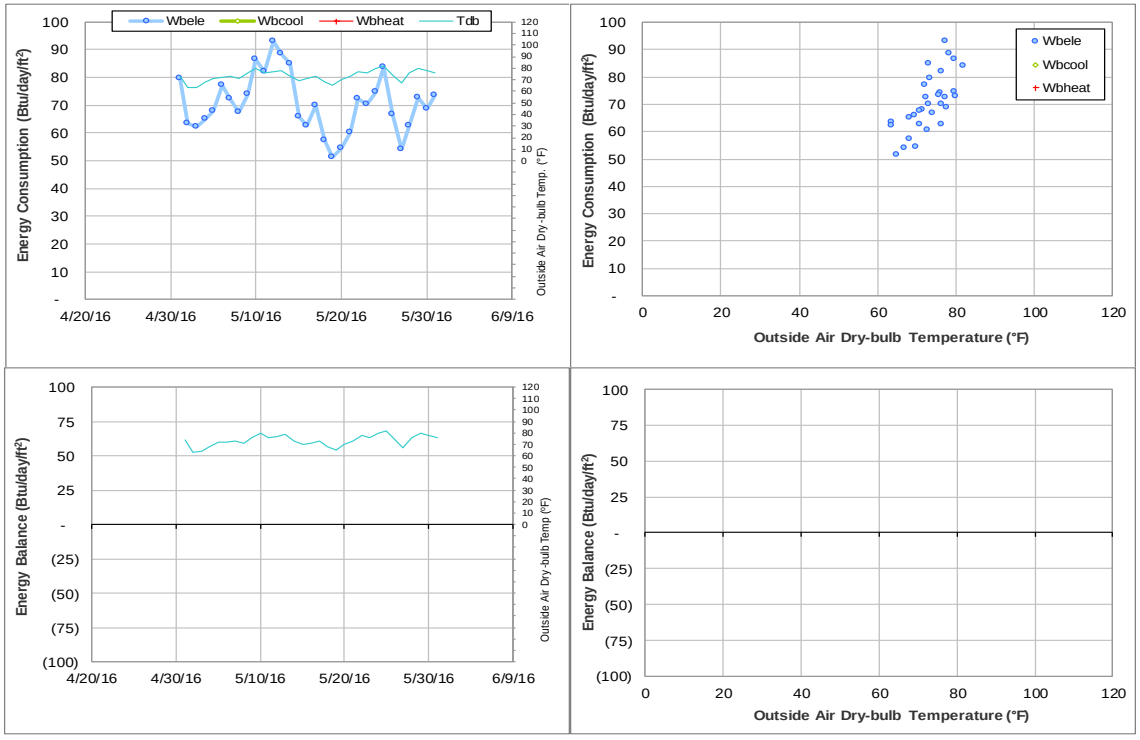


Figure IV-145 University Apartments - The Gardens P TAMU BLDG # 1459 Energy Balance Plot during May 2016

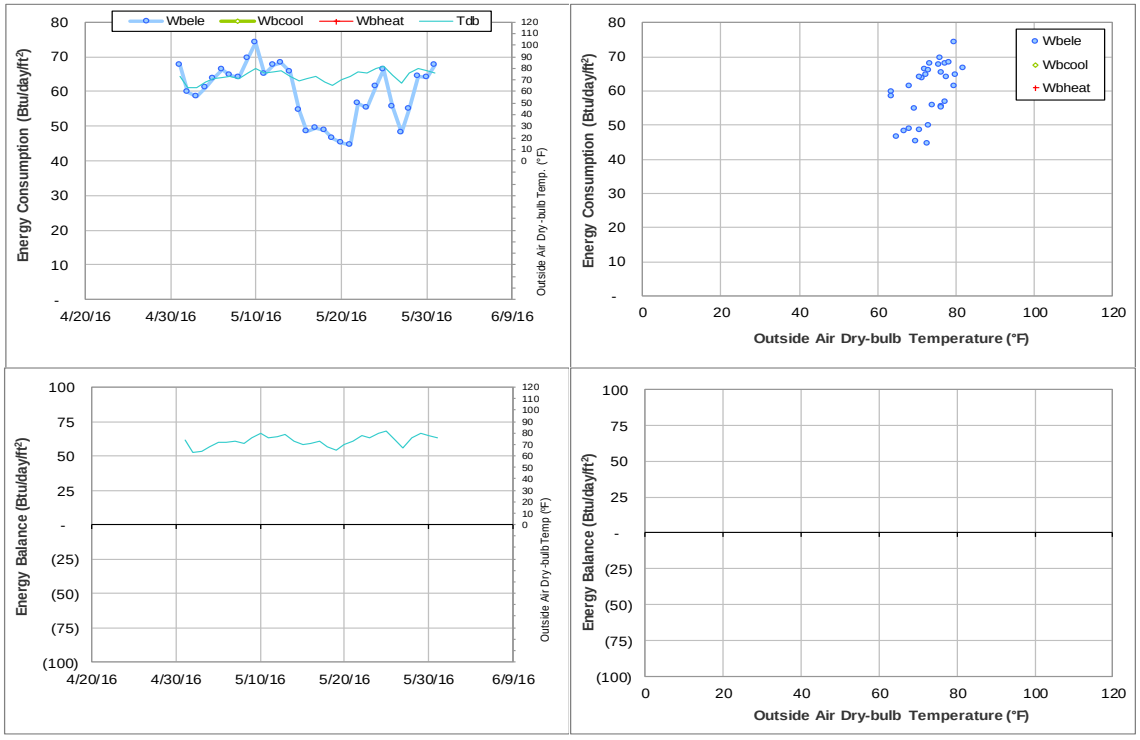


Figure IV-146 University Apartments - The Gardens Q TAMU BLDG # 1460 Energy Balance Plot during May 2016

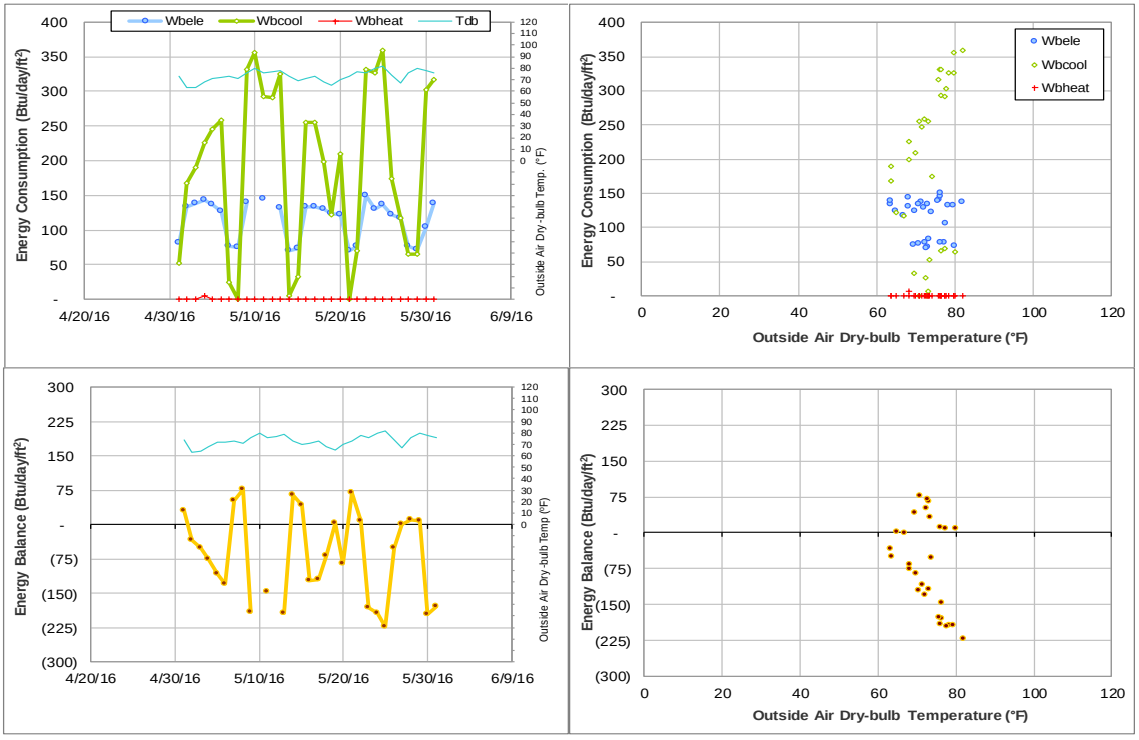


Figure IV-147 Utilities & Energy Services Business Office TAMU BLDG # 1497 Energy Balance Plot during May 2016

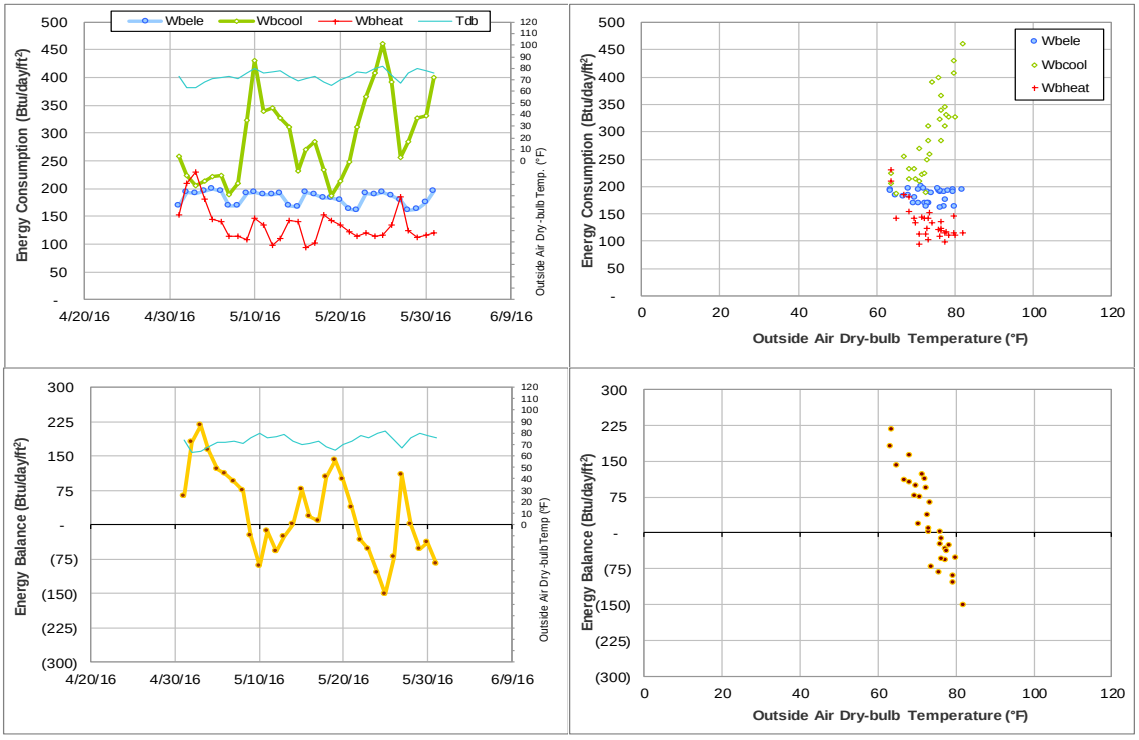


Figure IV-148 Kleberg Center TAMU BLDG # 1501 Energy Balance Plot during May 2016

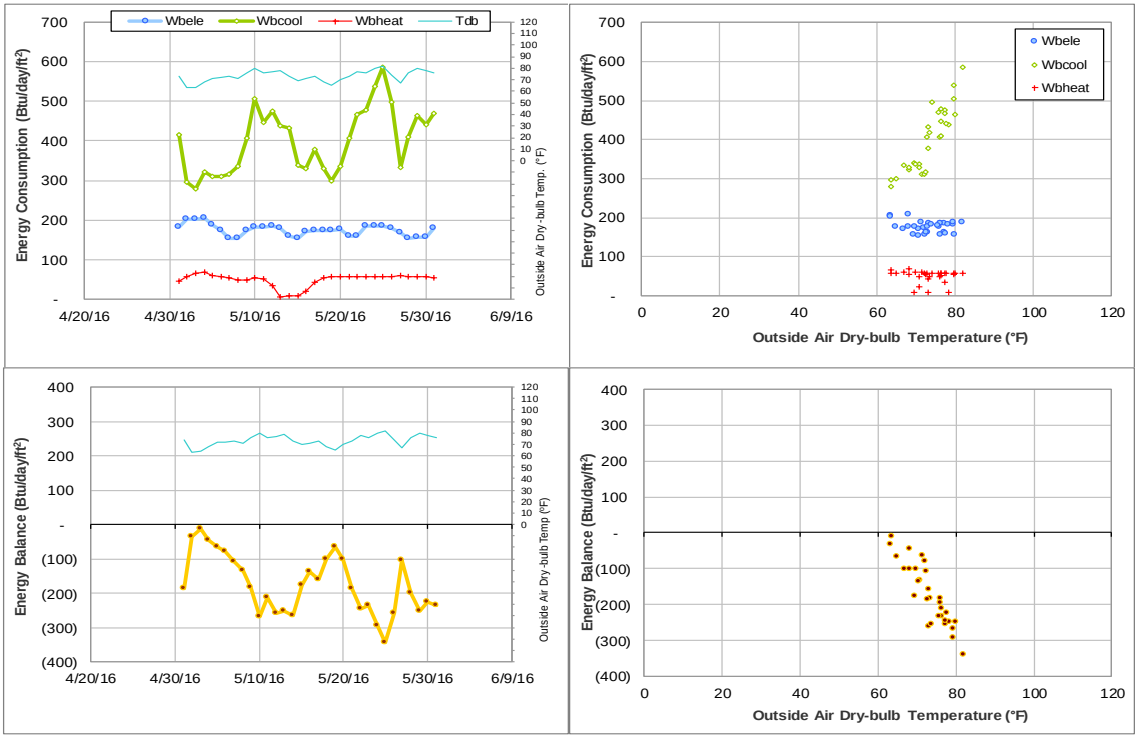


Figure IV-149 Heep Center TAMU BLDG # 1502 Energy Balance Plot during May 2016

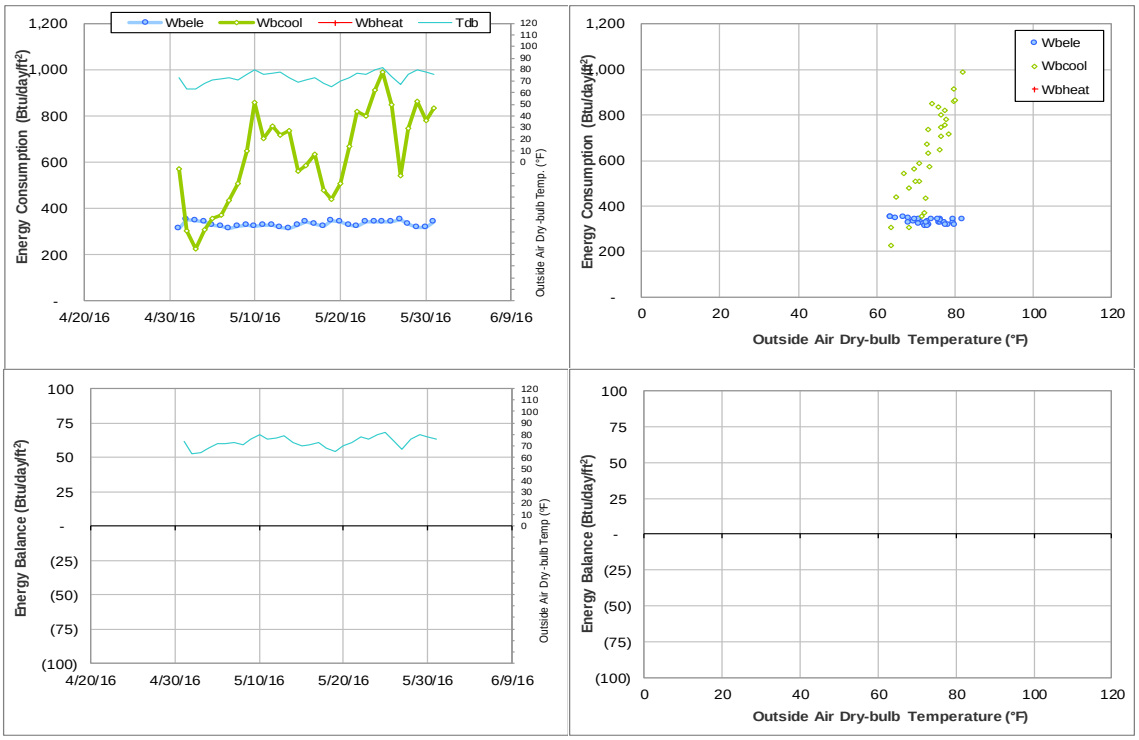


Figure IV-150 Cater-Mattil Hall TAMU BLDG # 1503 Energy Balance Plot during May 2016

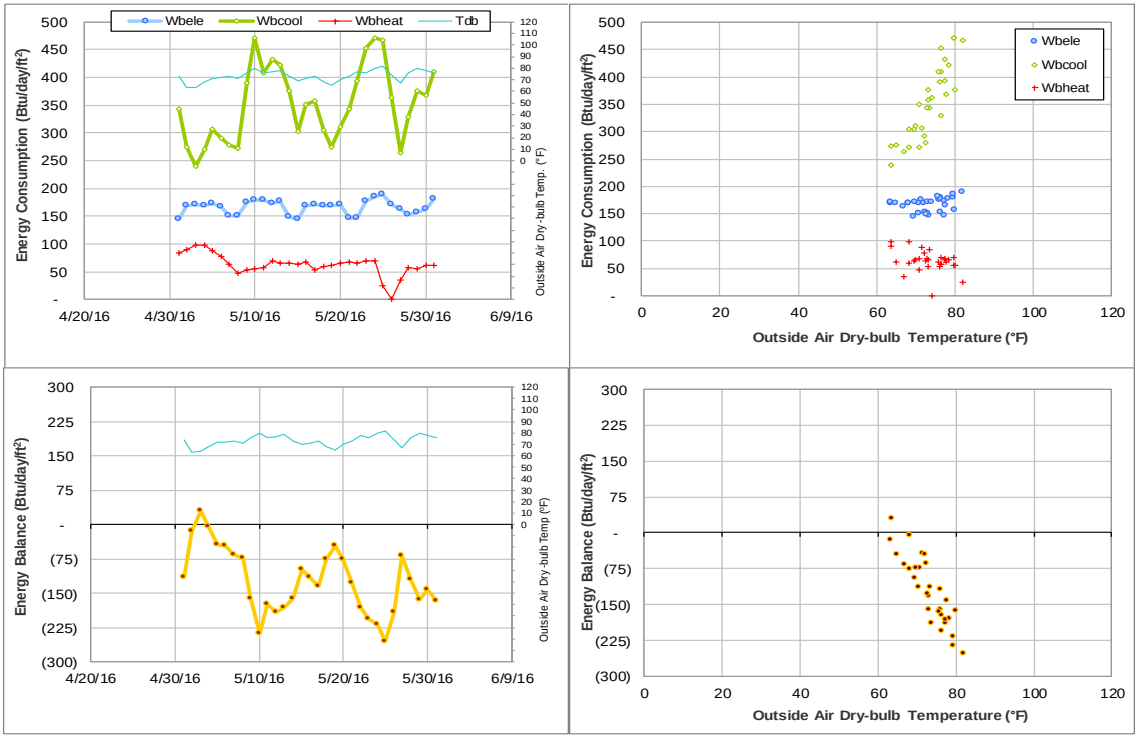


Figure IV-151 Reynolds Medical Sciences Building TAMU BLDG # 1504 Energy Balance Plot during May 2016

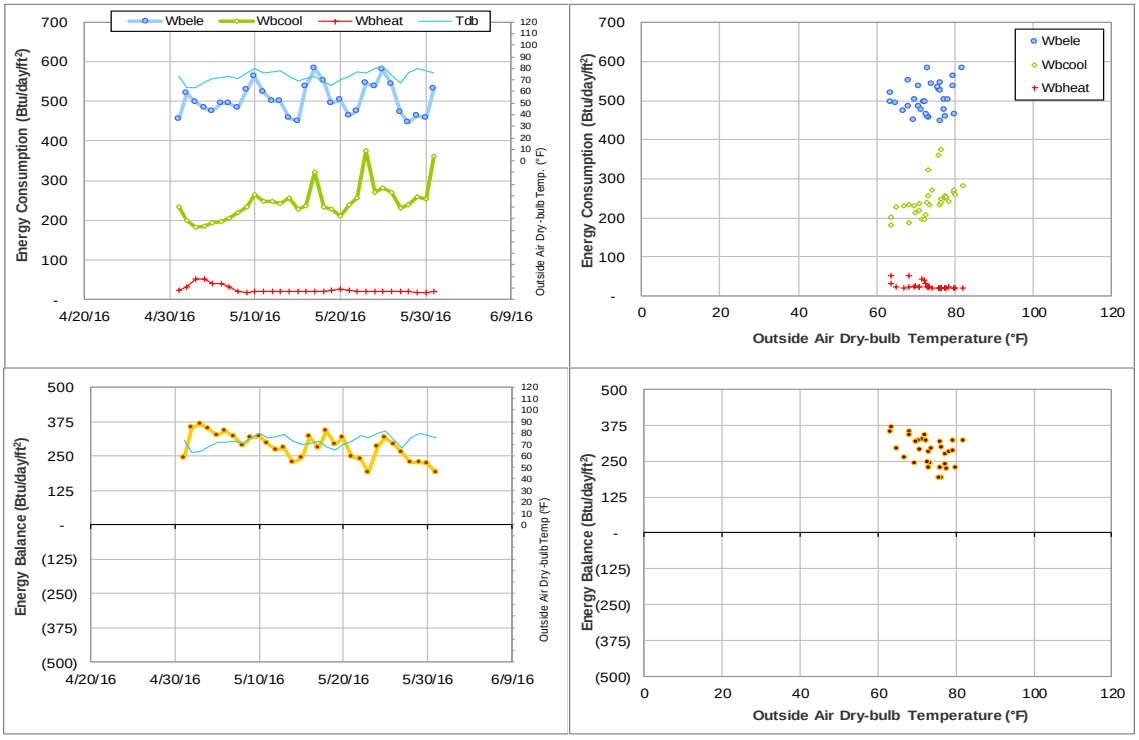


Figure IV-152 Rosenthal Meat Science & Technology Center TAMU BLDG # 1505 Energy Balance Plot during May 2016

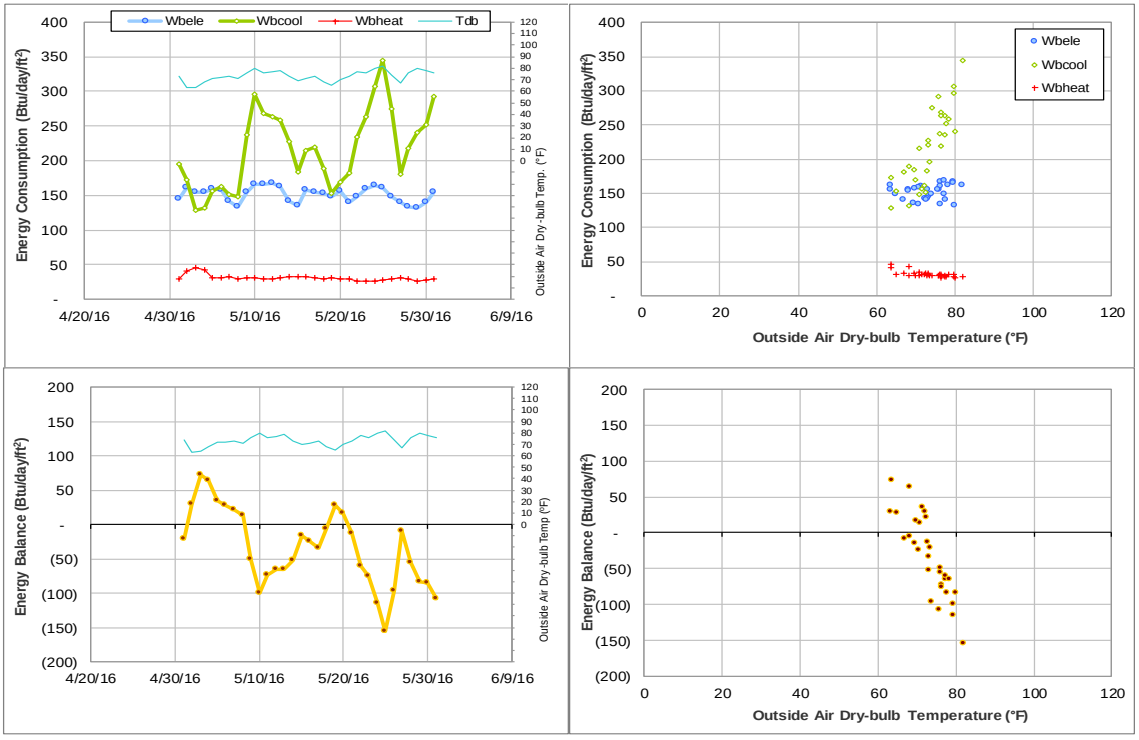


Figure IV-153 Horticulture-Forest Science Building TAMU BLDG # 1506 Energy Balance Plot during May 2016

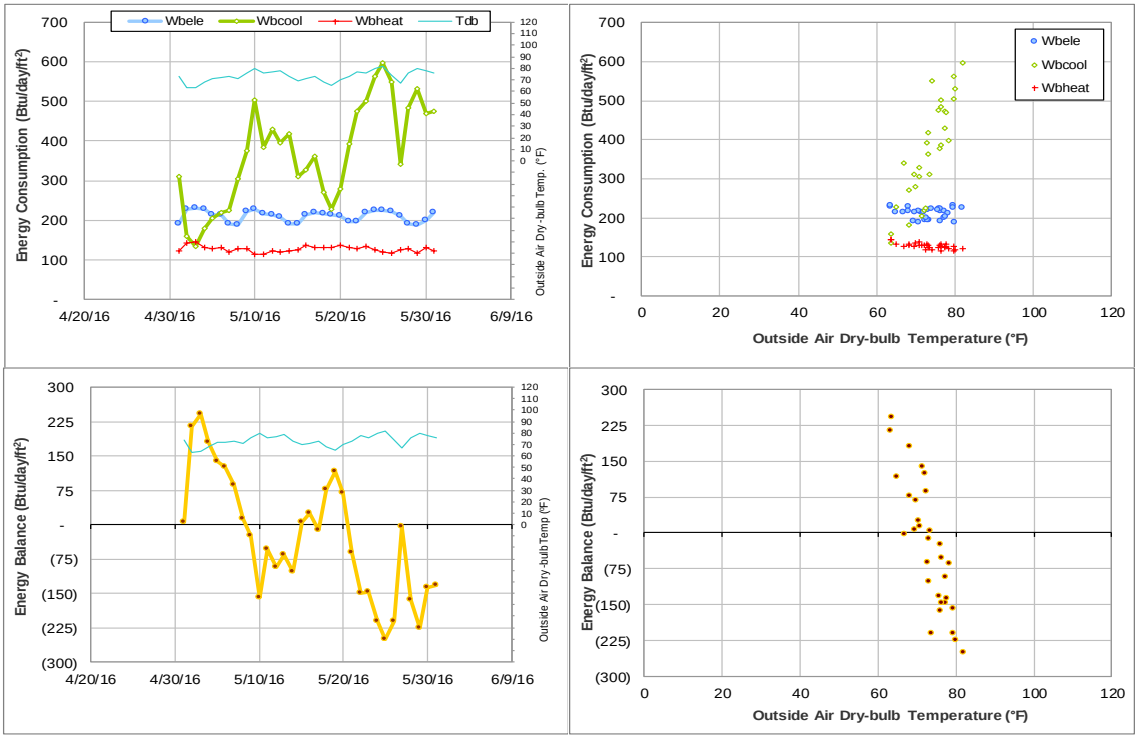


Figure IV-154 Biochemistry-Biophysics Building TAMU BLDG # 1507 Energy Balance Plot during May 2016

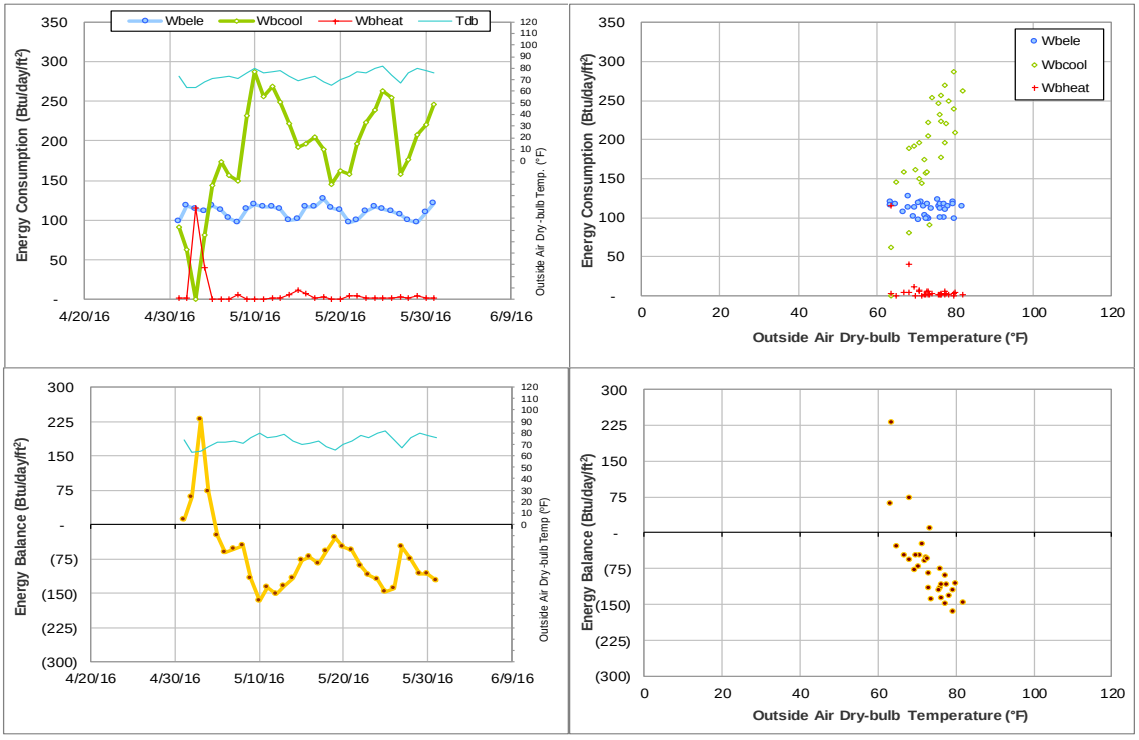


Figure IV-155 Price Hobgood Ag. Engineering Research Lab TAMU BLDG # 1508 Energy Balance Plot during May 2016

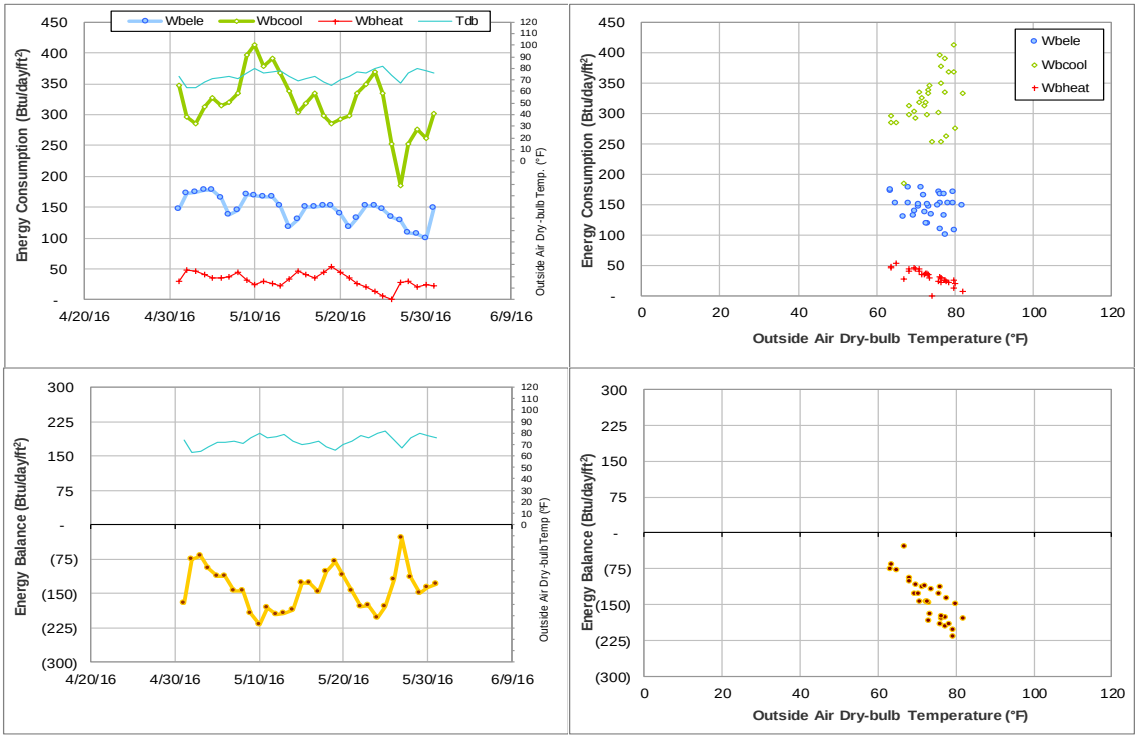


Figure IV-156 Medical Sciences Library TAMU BLDG # 1509 Energy Balance Plot during May 2016

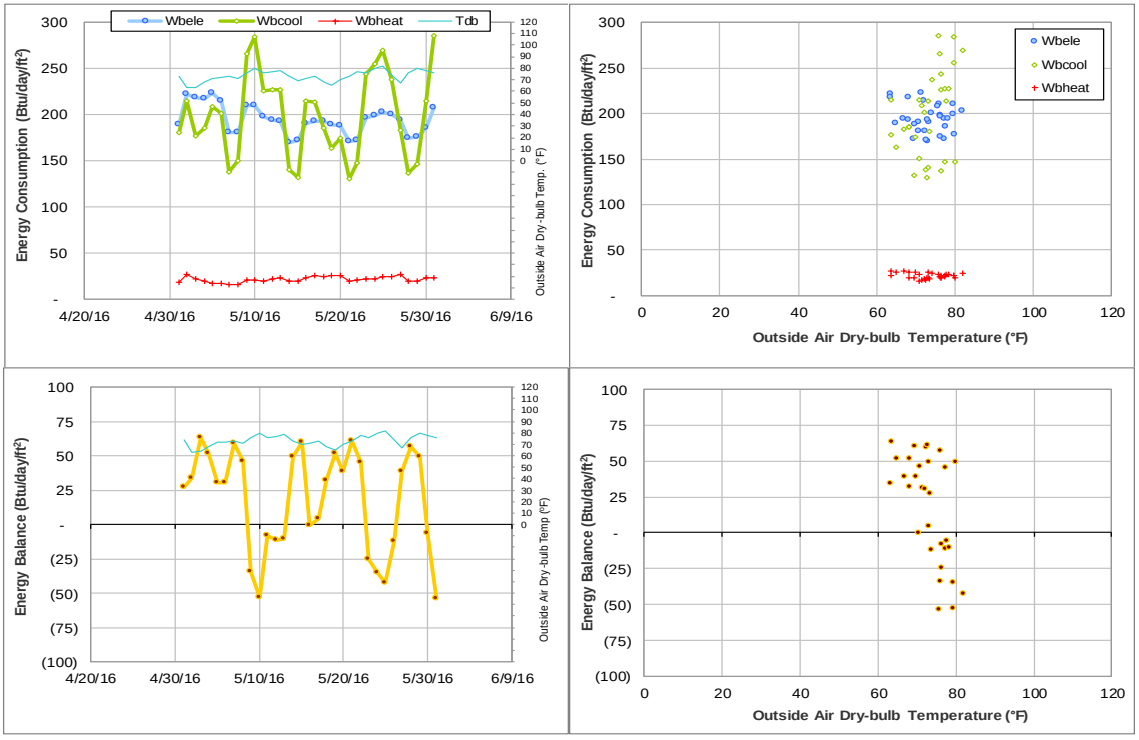


Figure IV-157 Wehner Building TAMU BLDG # 1510 Energy Balance Plot during May 2016

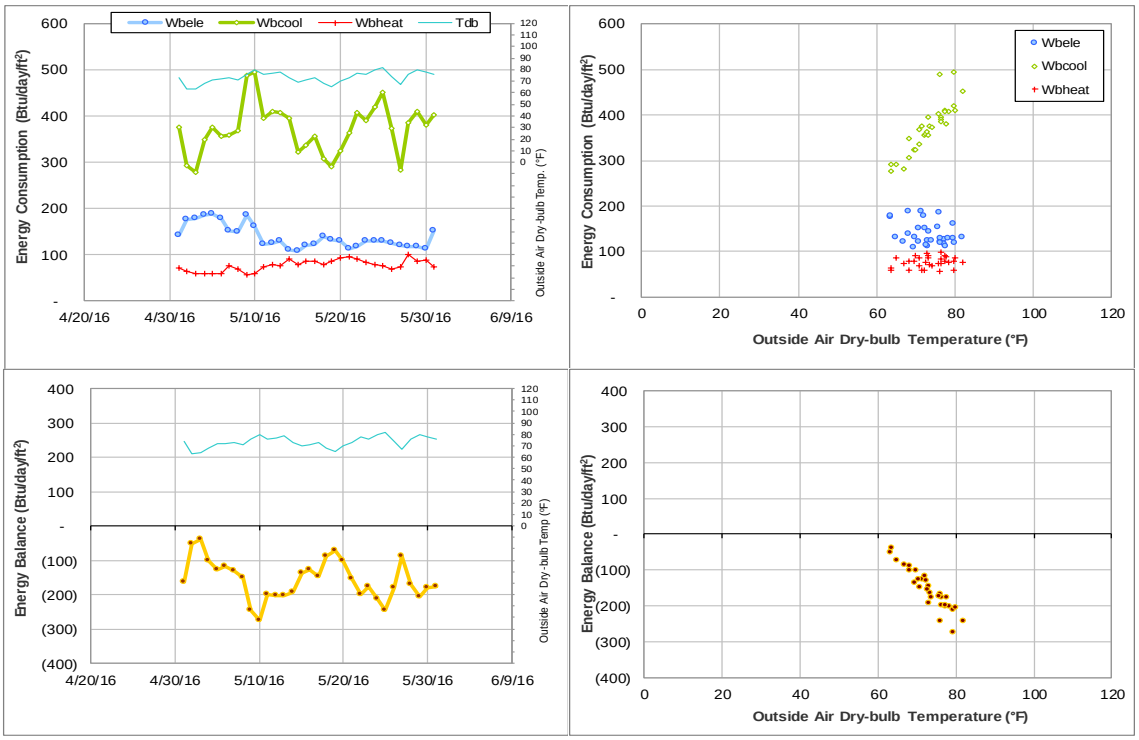


Figure IV-158 West Campus Library Facility TAMU BLDG # 1511 Energy Balance Plot during May 2016

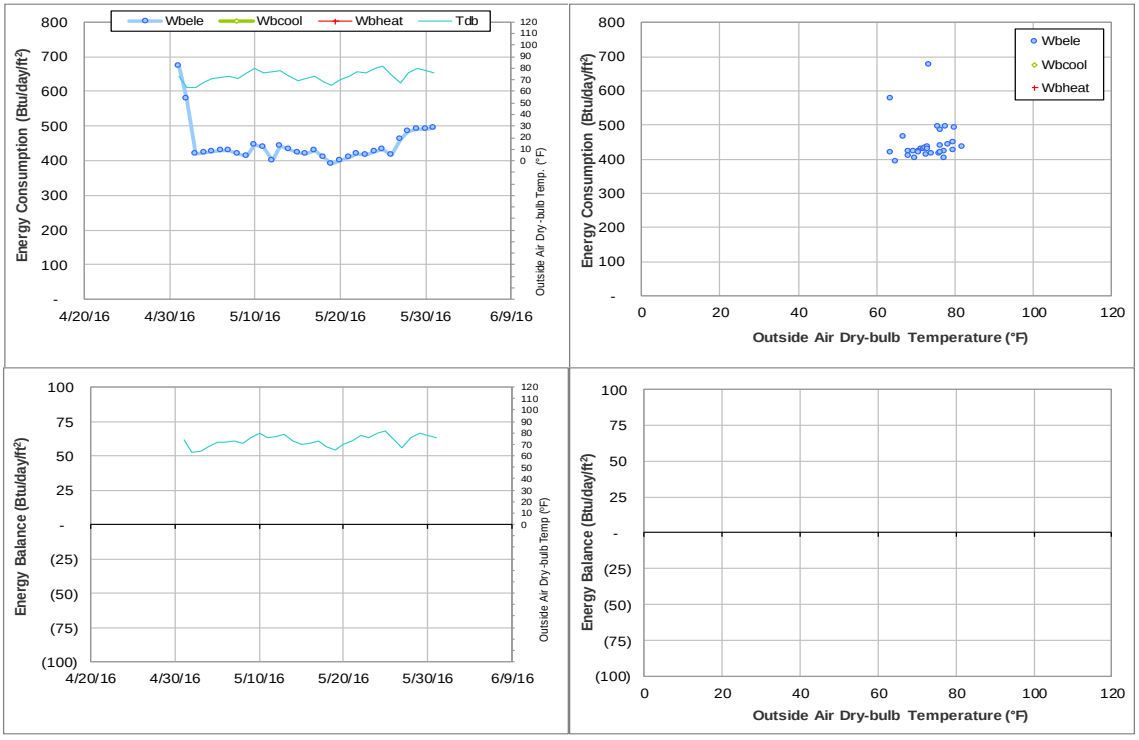


Figure IV-159 Southern Crop Improvement Greenhouse TAMU BLDG # 1512 Energy Balance Plot during May 2016

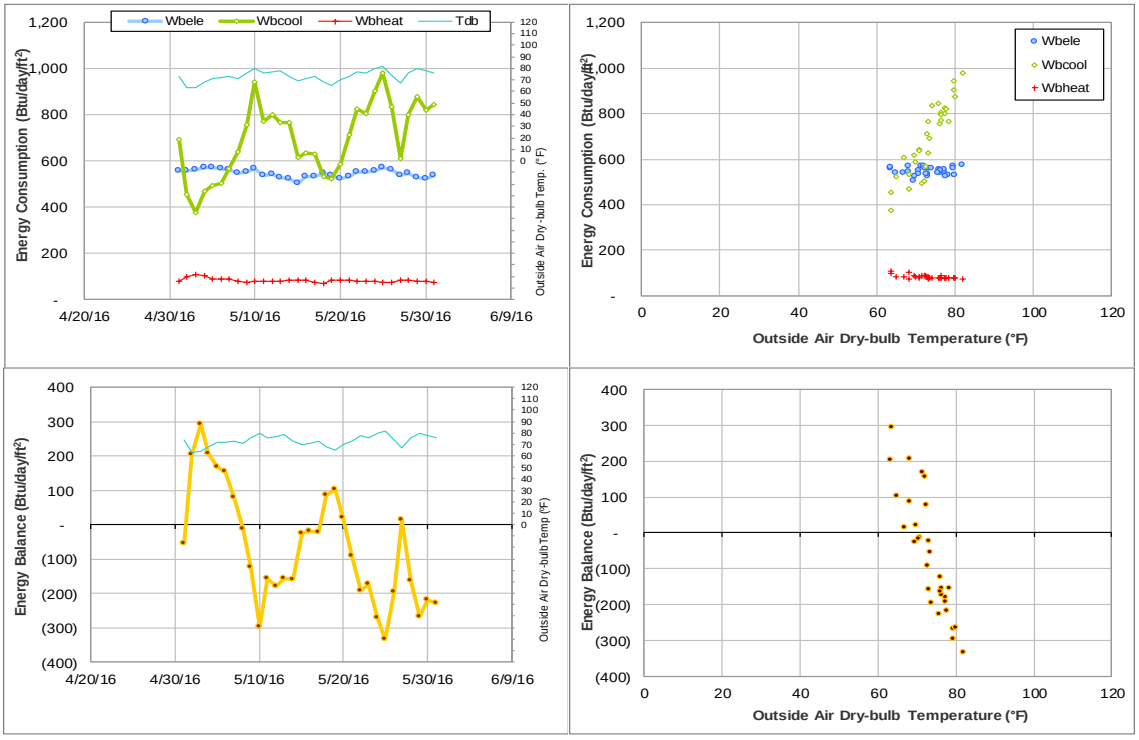


Figure IV-160 Borlaug Center for Southern Crop Improvement TAMU BLDG # 1513 Energy Balance Plot during May 2016

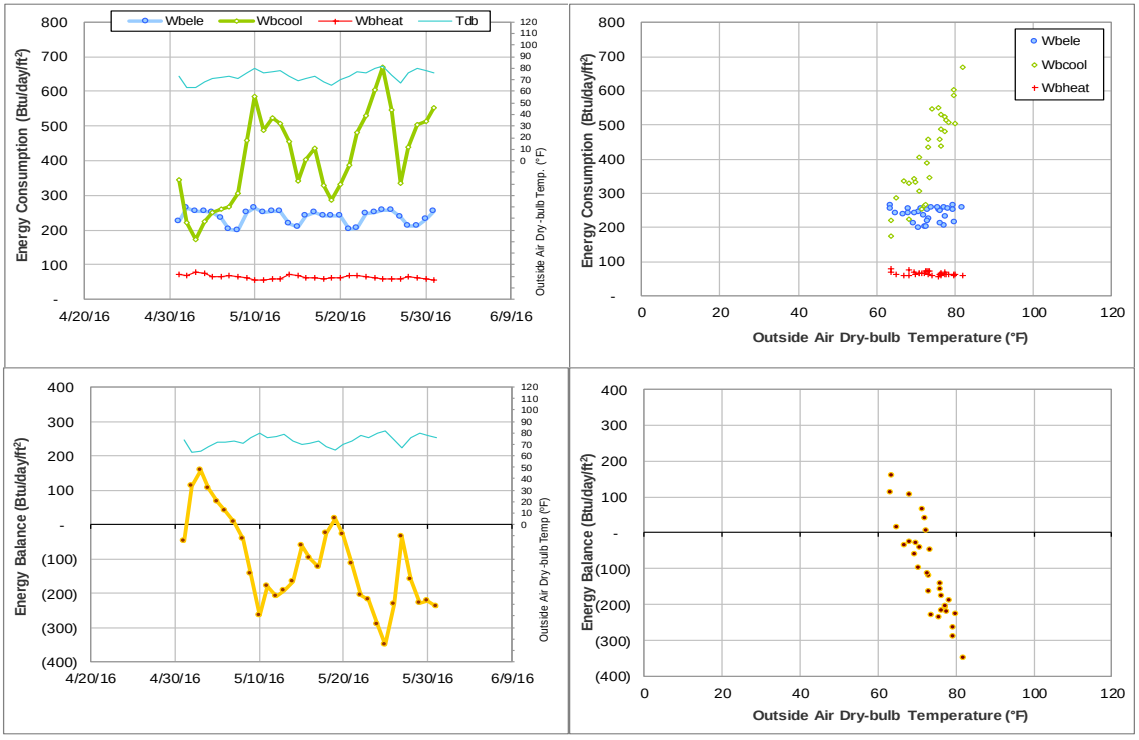


Figure IV-161 TX School of Rural Public Health TAMU BLDG # 1518 Energy Balance Plot during May 2016

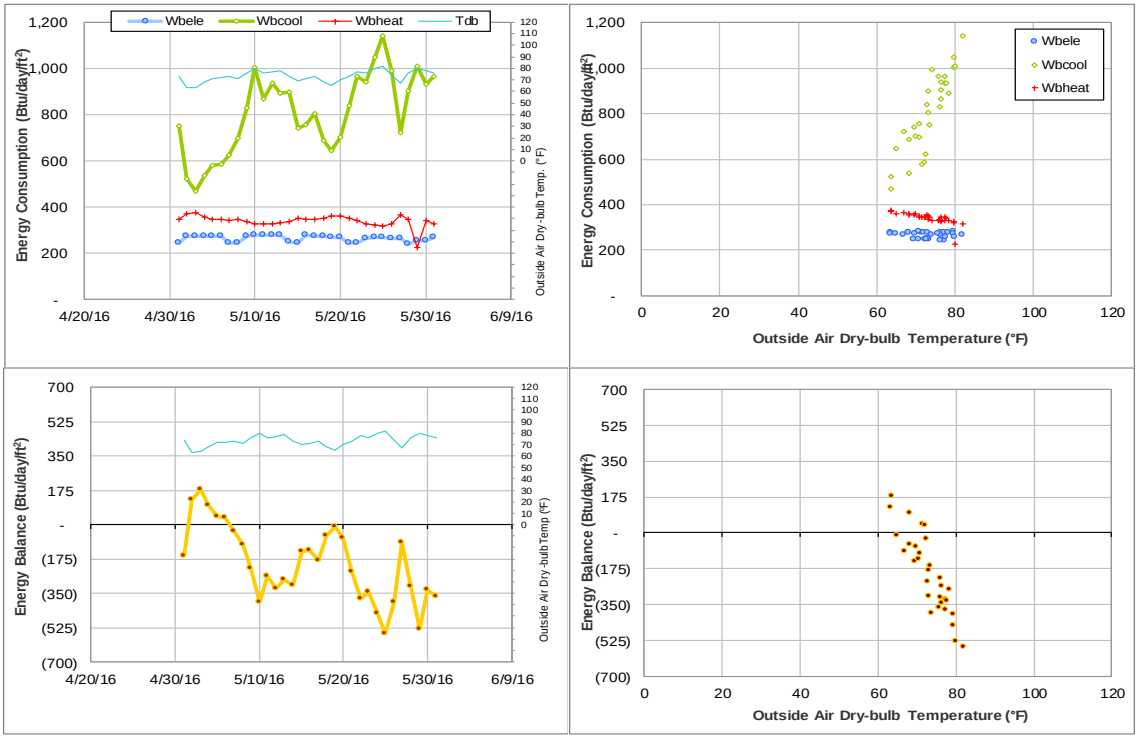


Figure IV-162 Nuclear Magnetic Resonance Facility TAMU BLDG # 1525 Energy Balance Plot during May 2016

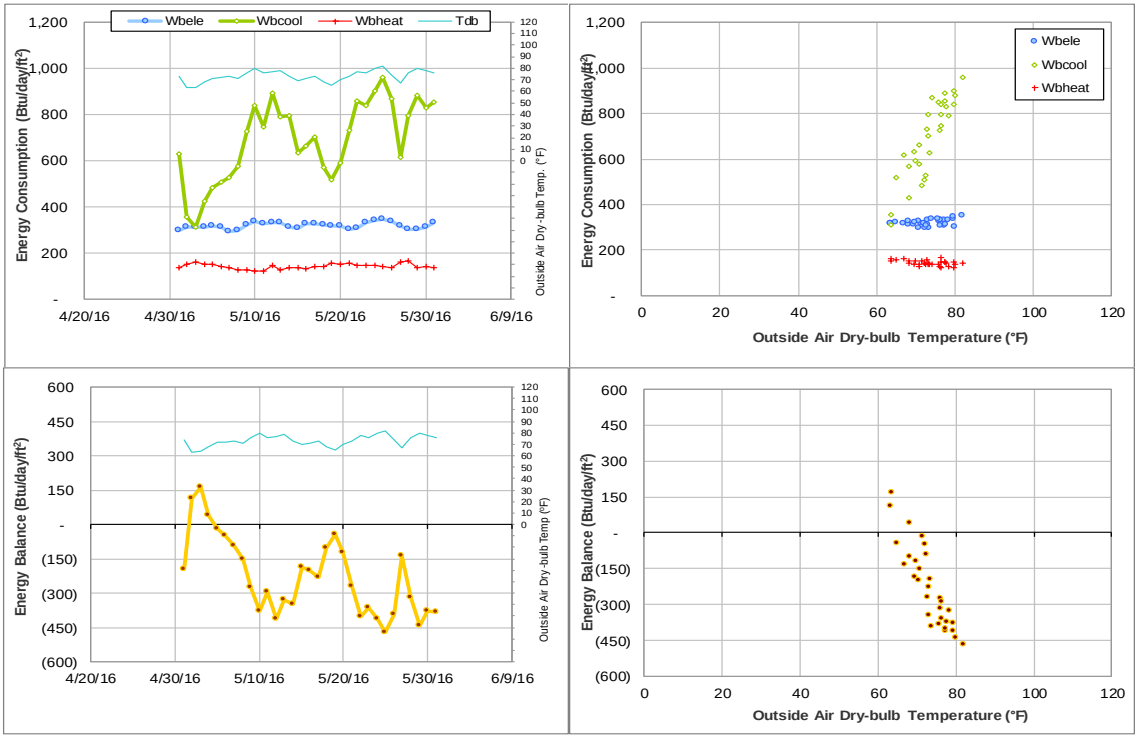


Figure IV-163 Interdisciplinary Life Sciences Building TAMU BLDG # 1530 Energy Balance Plot during May 2016

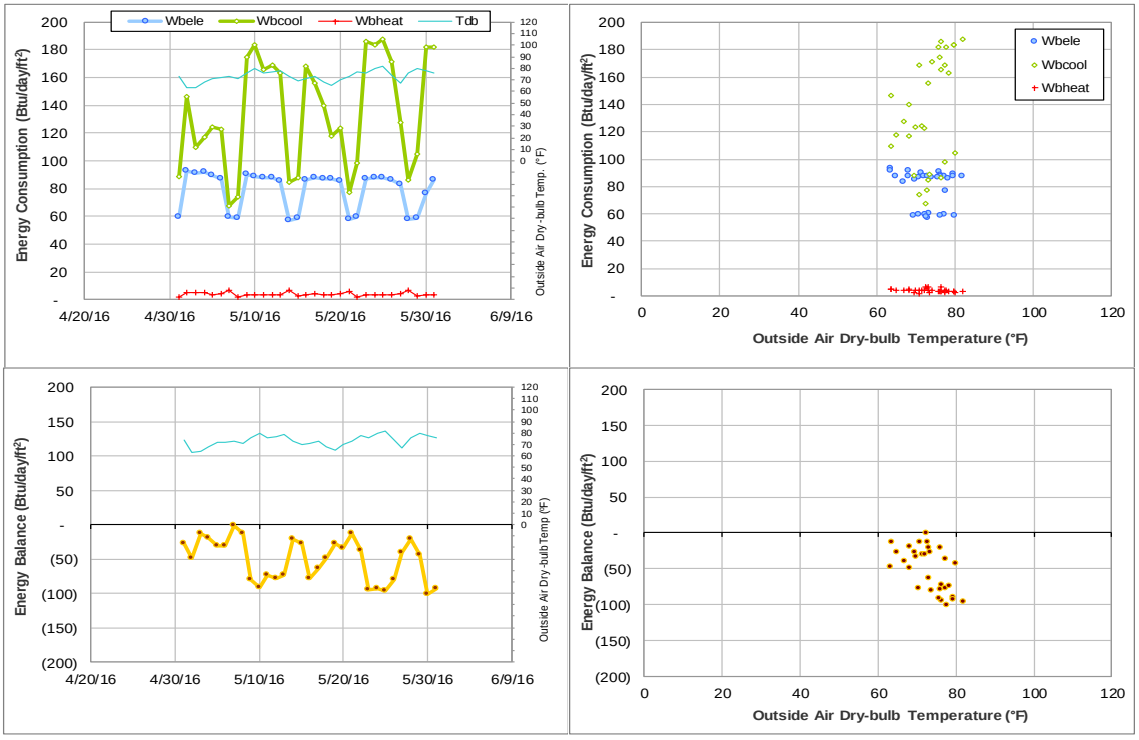


Figure IV-164 Agriculture and Life Sciences Building TAMU BLDG # 1535 Energy Balance Plot during May 2016

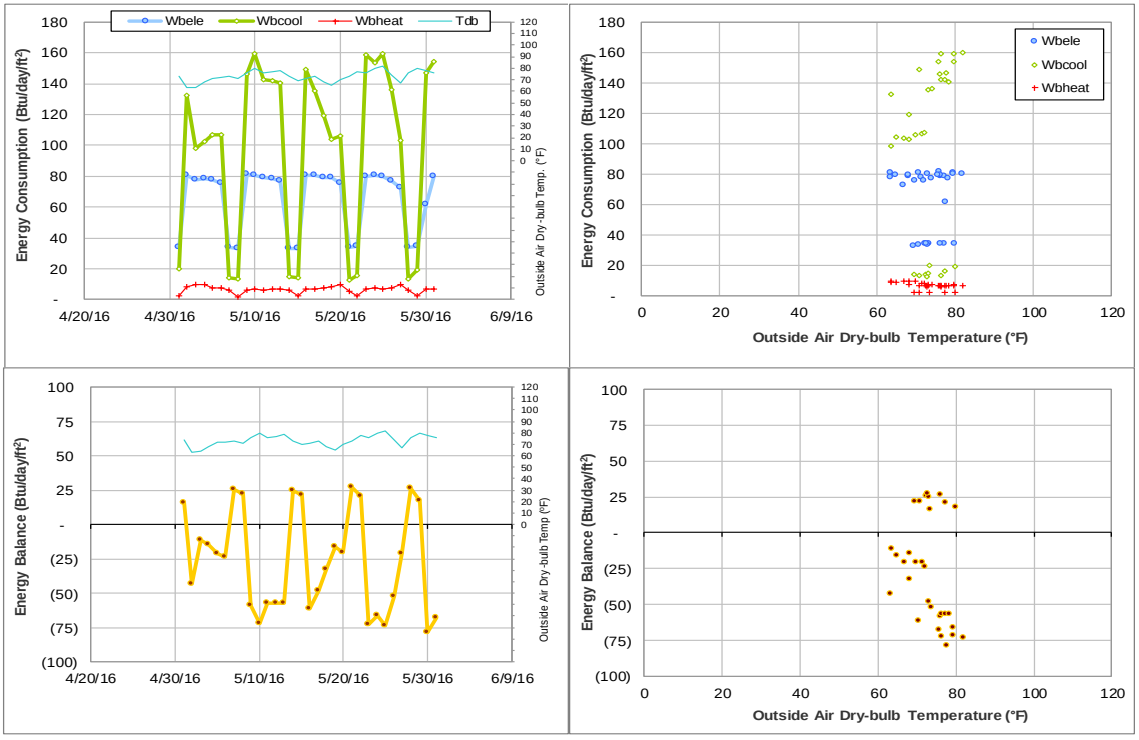


Figure IV-165 AgriLife Services Building TAMU BLDG # 1536 Energy Balance Plot during May 2016

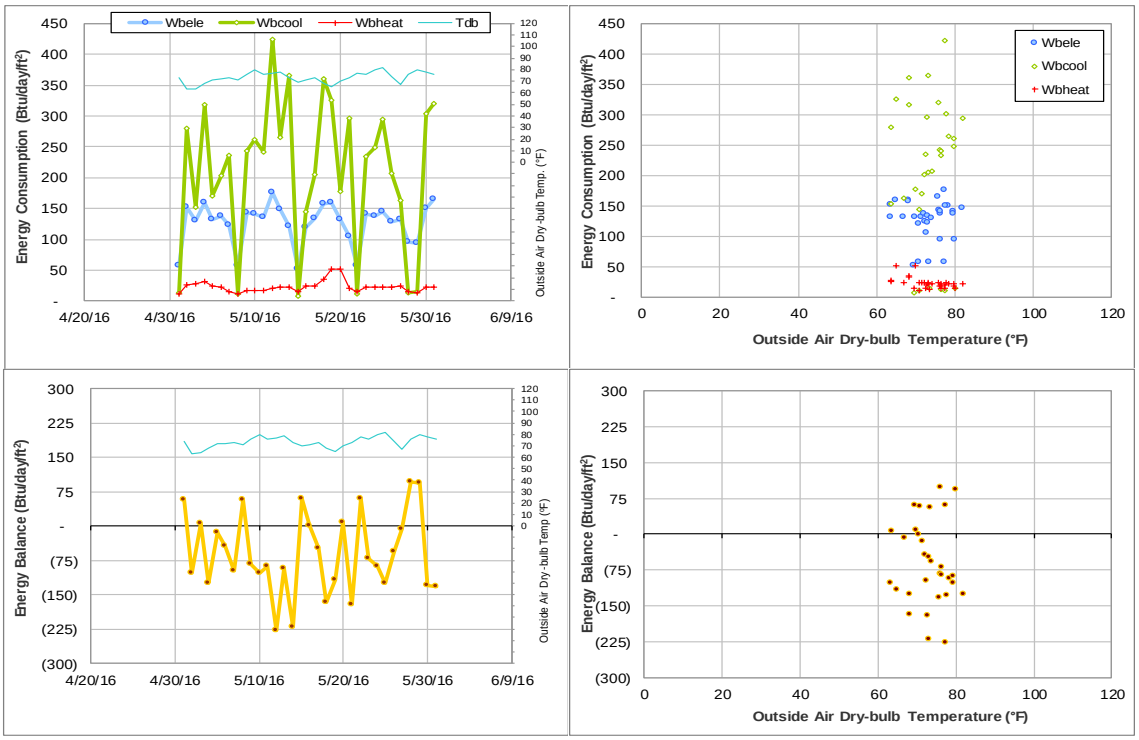


Figure IV-166 Agriculture Program Visitors Center TAMU BLDG # 1538 Energy Balance Plot during May 2016

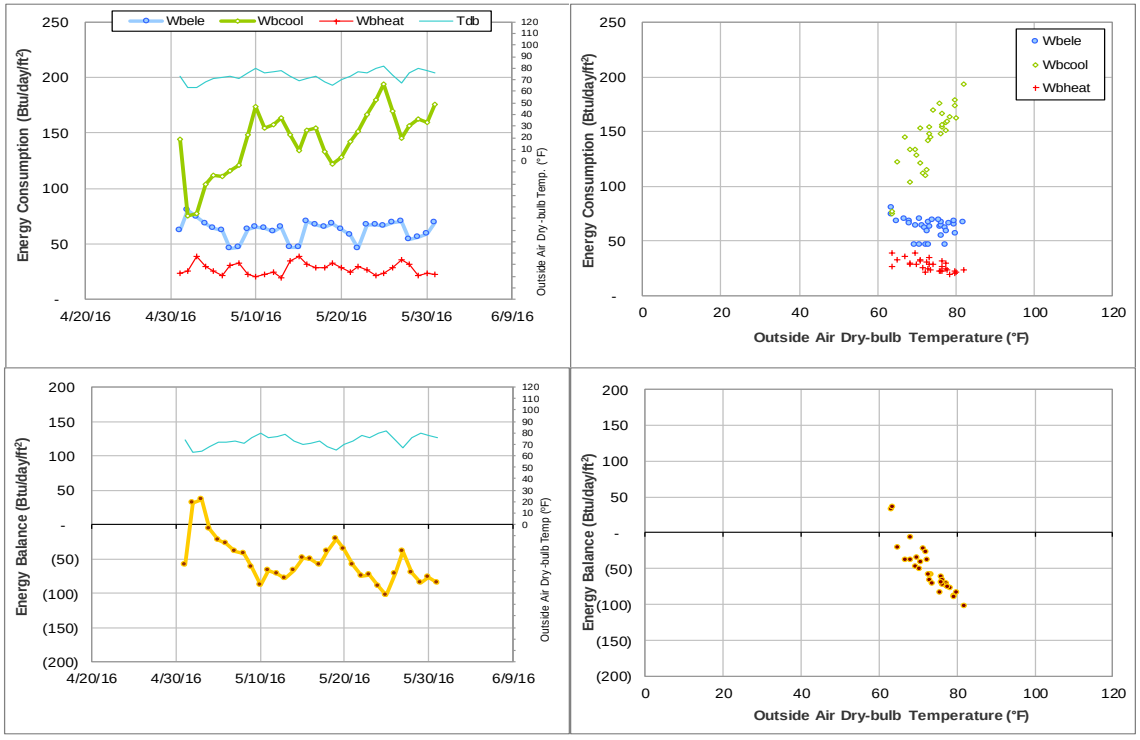


Figure IV-167 Physical Education Activity Program Building TAMU BLDG # 1540 Energy Balance Plot during May 2016

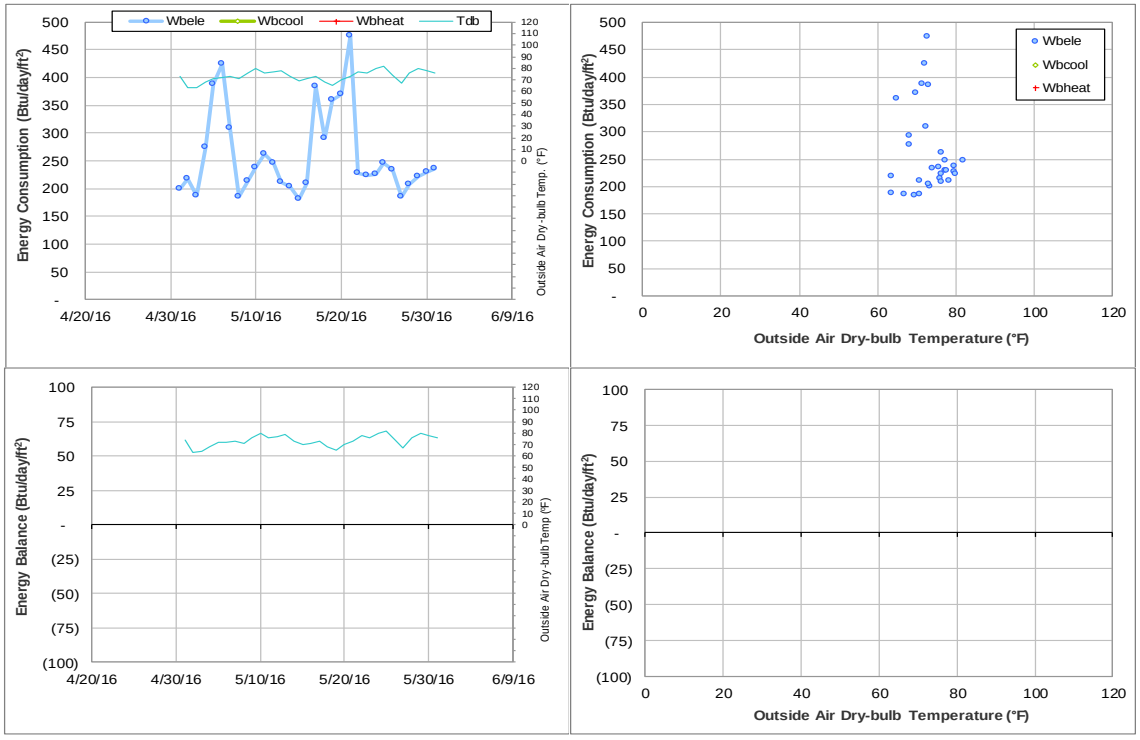


Figure IV-168 Olsen Field at Bluebell Park TAMU BLDG # 1550 Energy Balance Plot during May 2016

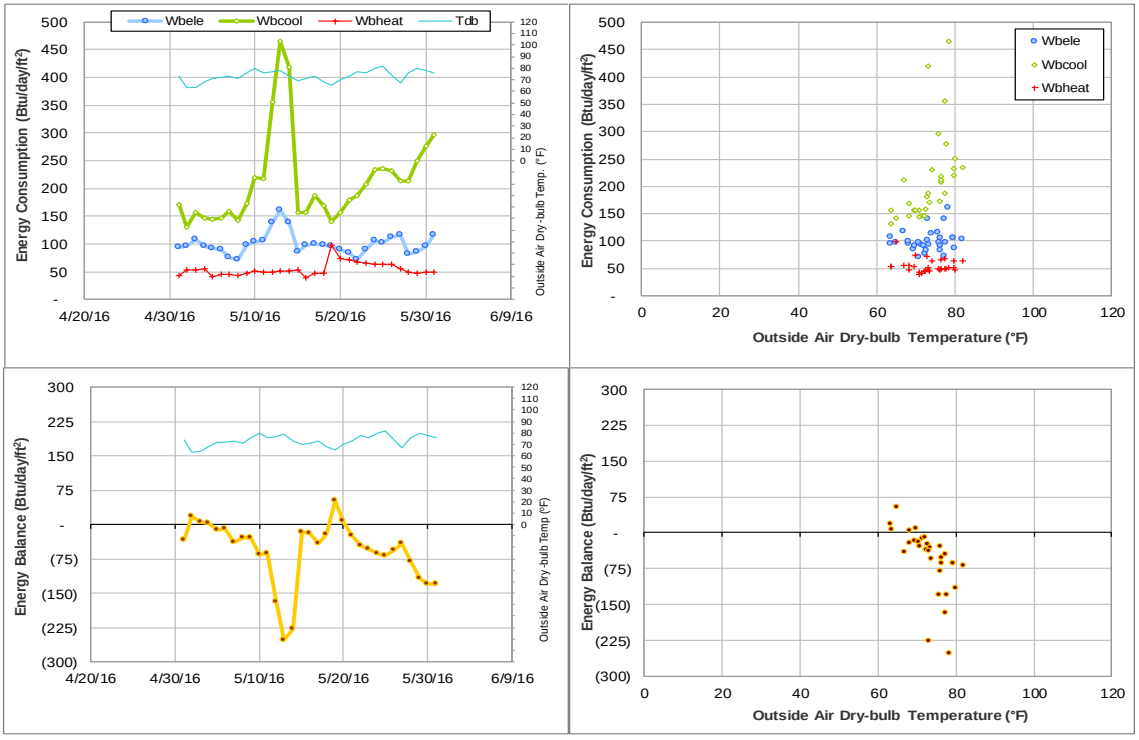


Figure IV-169 Reed Arena and Cox-McFerrin Center TAMU BLDG # 1554-1558 Energy Balance Plot during May 2016

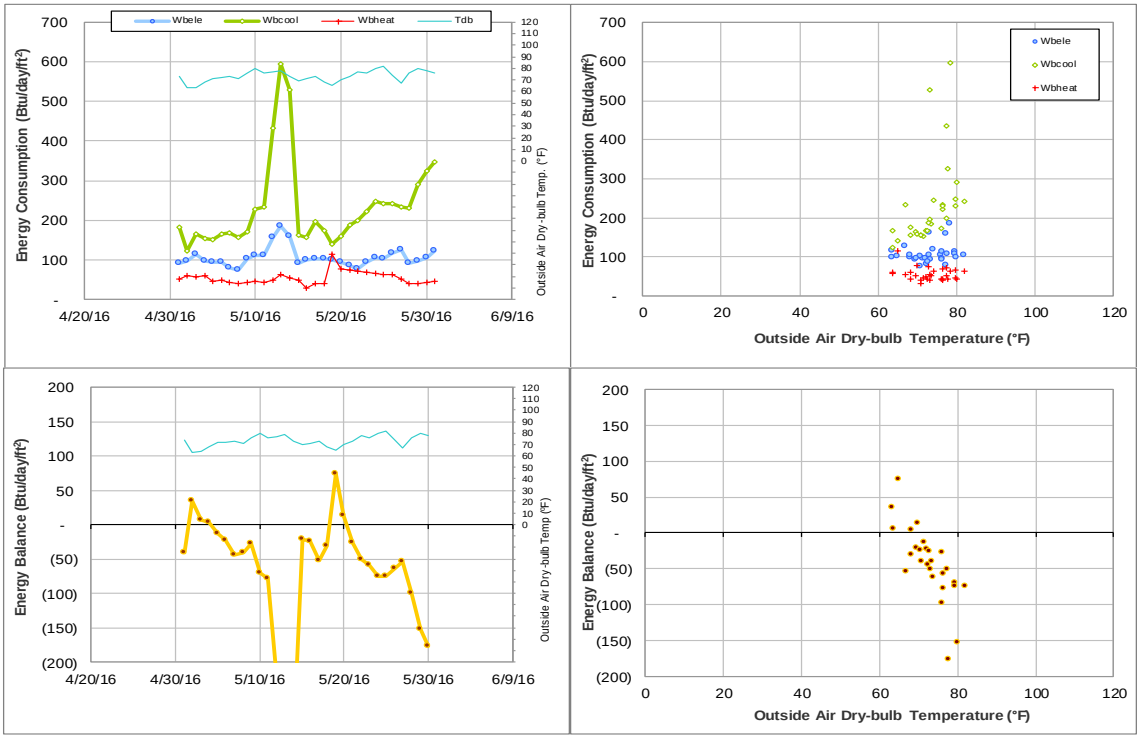


Figure IV-170 Reed Arena TAMU BLDG # 1554 Energy Balance Plot during May 2016

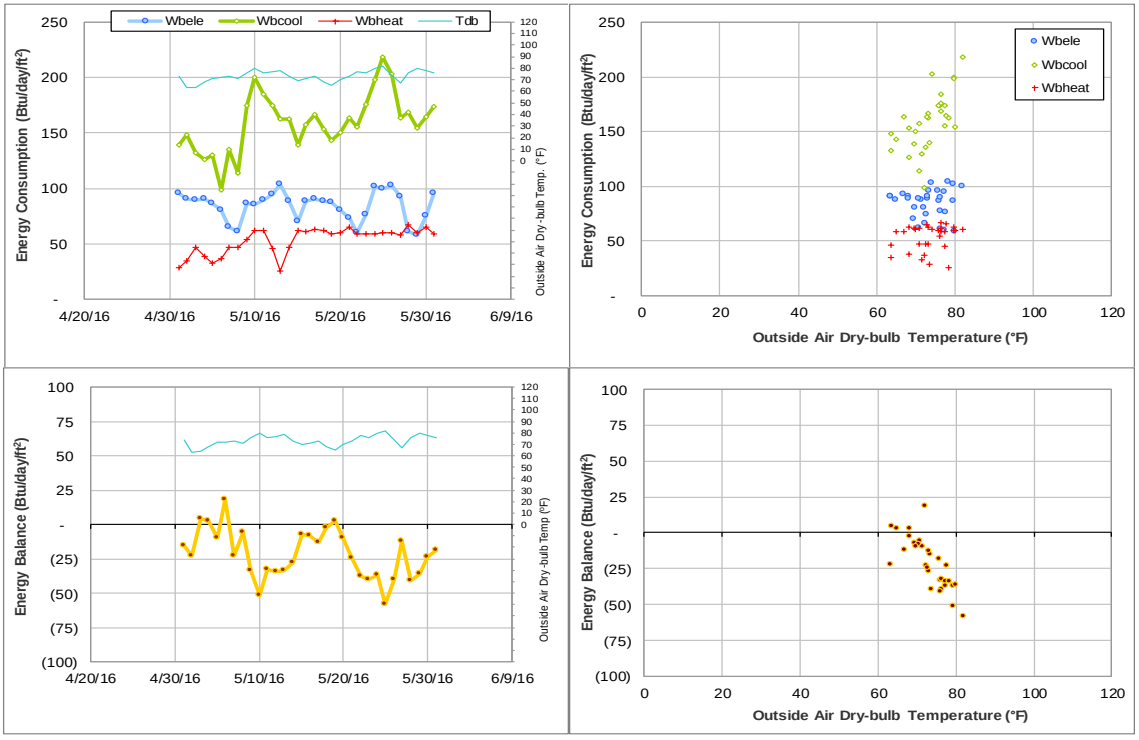


Figure IV-171 Cox-McFerrin Center for Aggie Basketball TAMU BLDG # 1558 Energy Balance Plot during May 2016

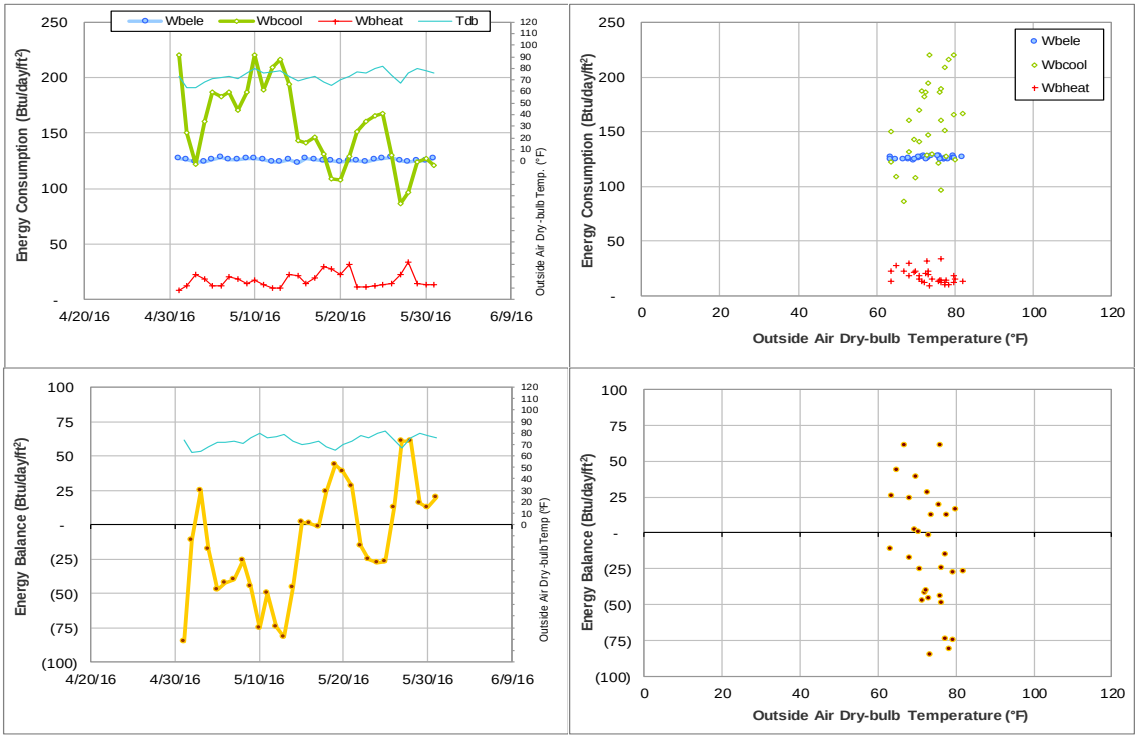


Figure IV-172 West Campus Parking Garage TAMU BLDG # 1559 Energy Balance Plot during May 2016

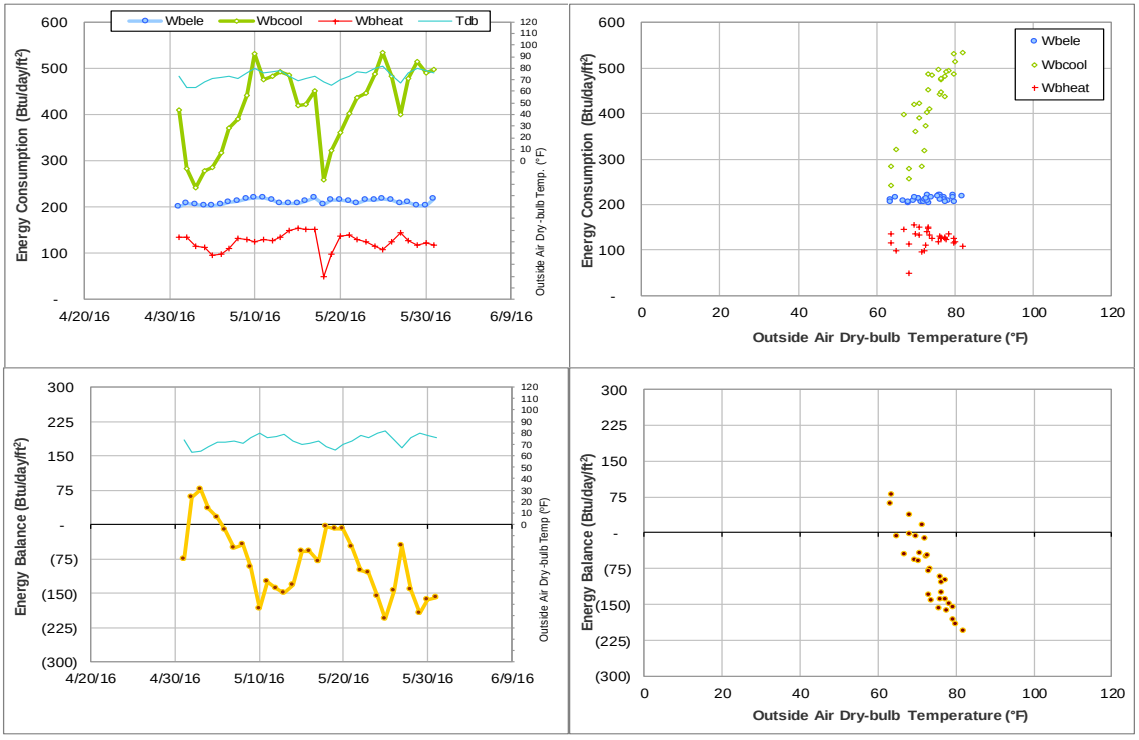


Figure IV-173 Student Recreation Center TAMU BLDG # 1560 Energy Balance Plot during May 2016

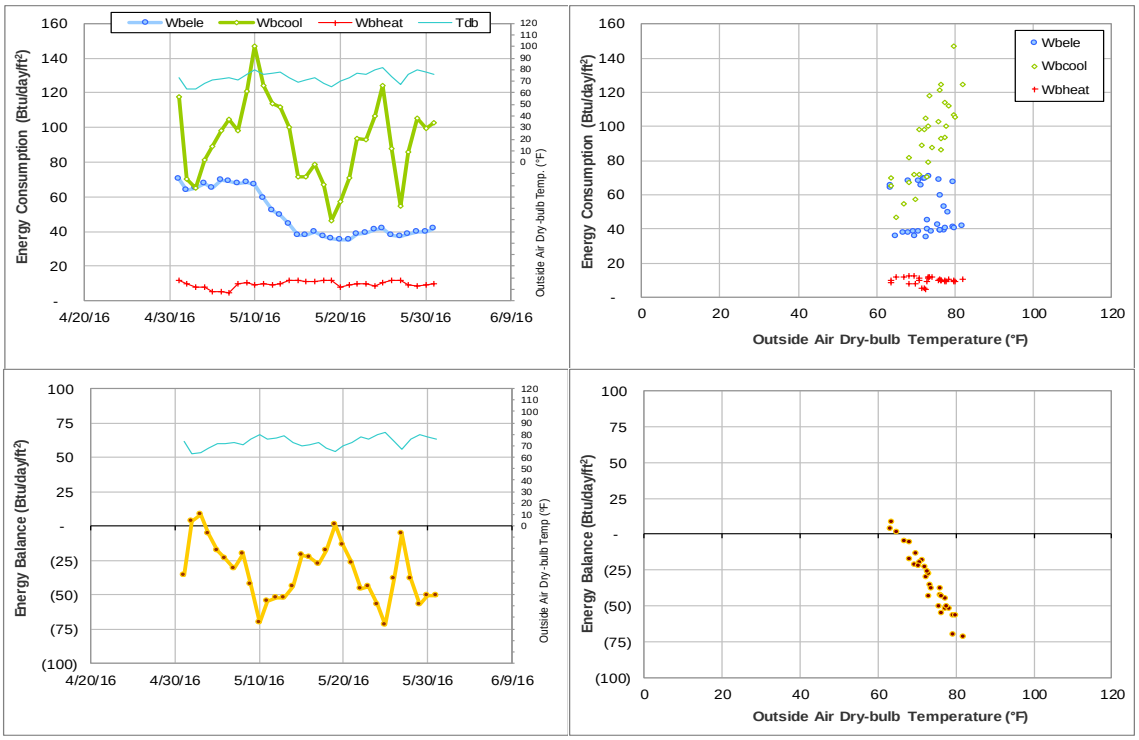


Figure IV-174 White Creek Apartment 1 and White Creek Apts Activity Center TAMU BLDG # 1589-1590 Energy Balance Plot during May 2016

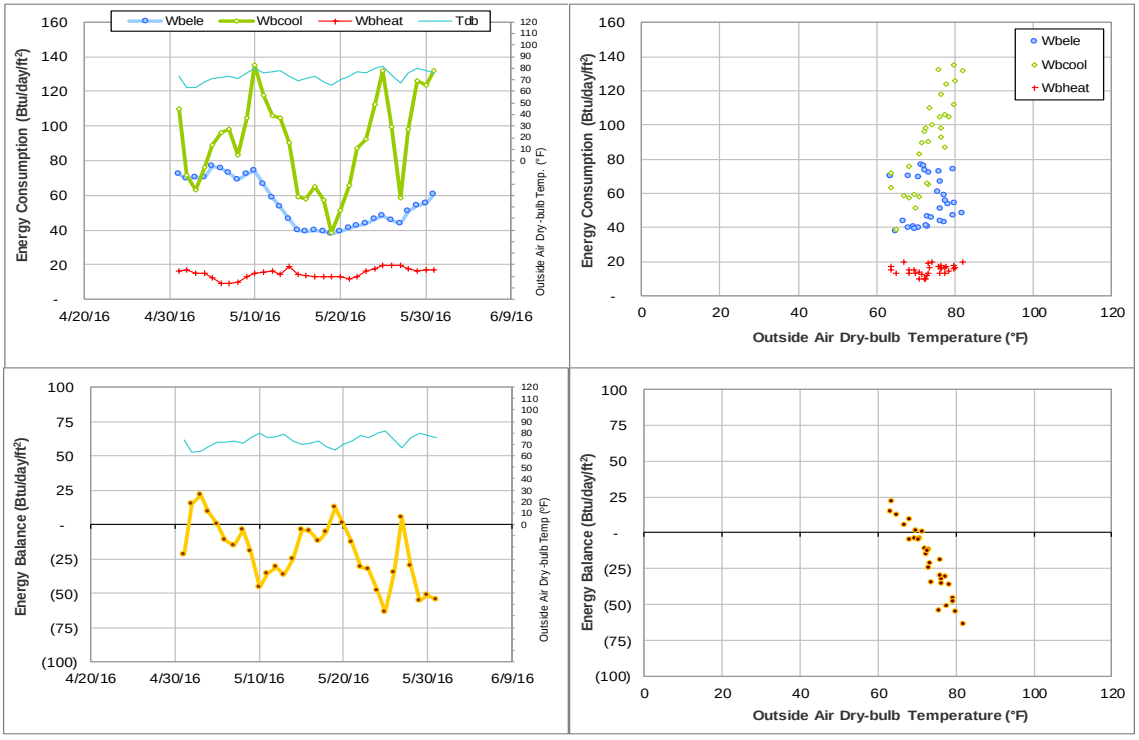


Figure IV-175 White Creek Apartment 2 TAMU BLDG # 1591 Energy Balance Plot during May 2016

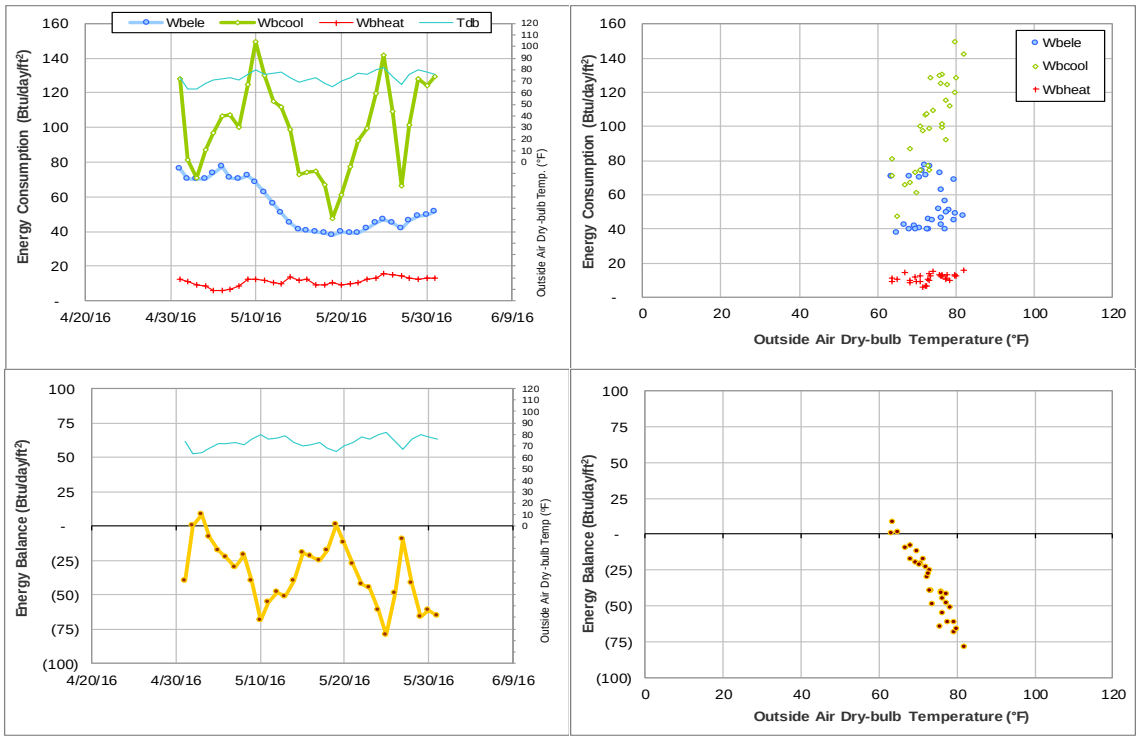


Figure IV-176 White Creek Apartment 3 TAMU BLDG # 1592 Energy Balance Plot during May 2016

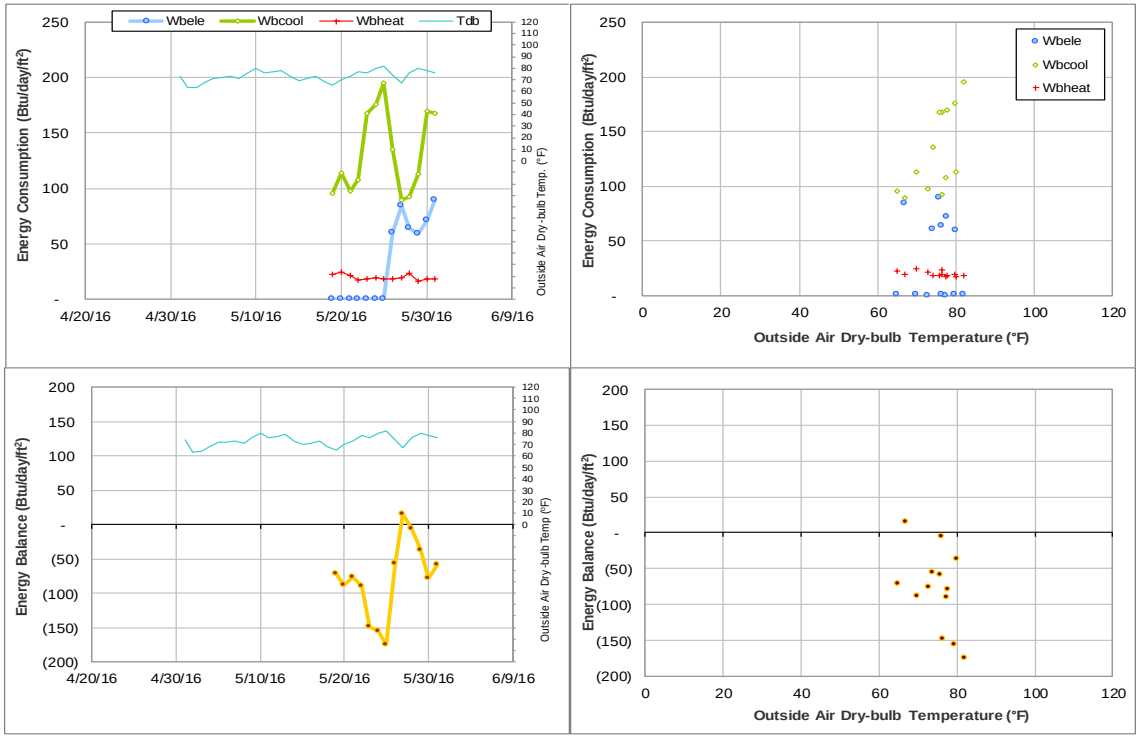


Figure IV-177 Gilchrist TTI Building TAMU BLDG # 1600 Energy Balance Plot during May 2016

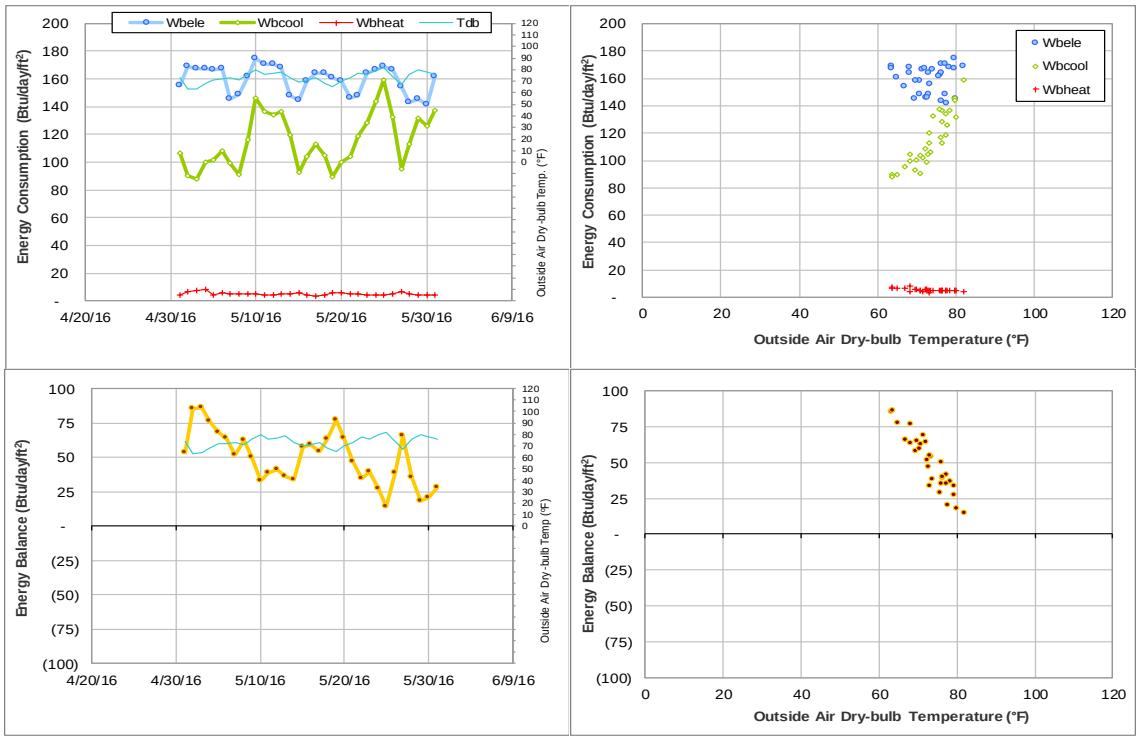


Figure IV-178 International Ocean Discovery Building TAMU BLDG # 1601 Energy Balance Plot during May 2016

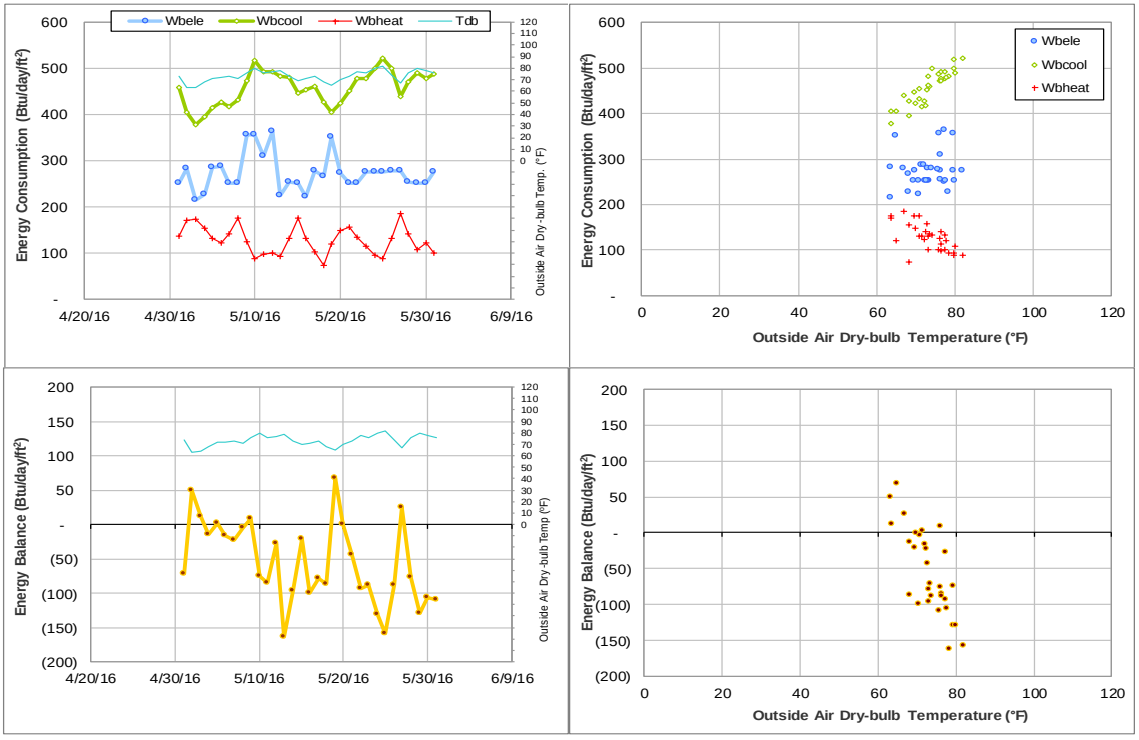


Figure IV-179 Offshore Technology Research Center TAMU BLDG # 1604 Energy Balance Plot during May 2016

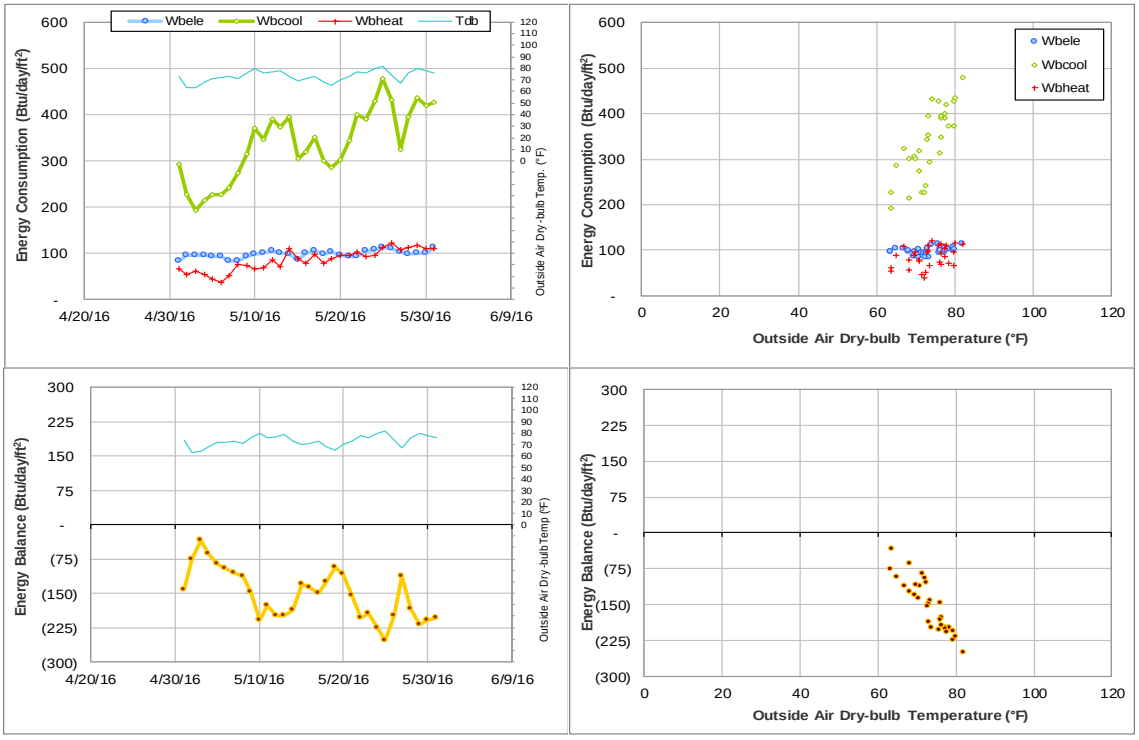


Figure IV-180 George Bush Presidential Library & Museum TAMU BLDG # 1606 Energy Balance Plot during May 2016

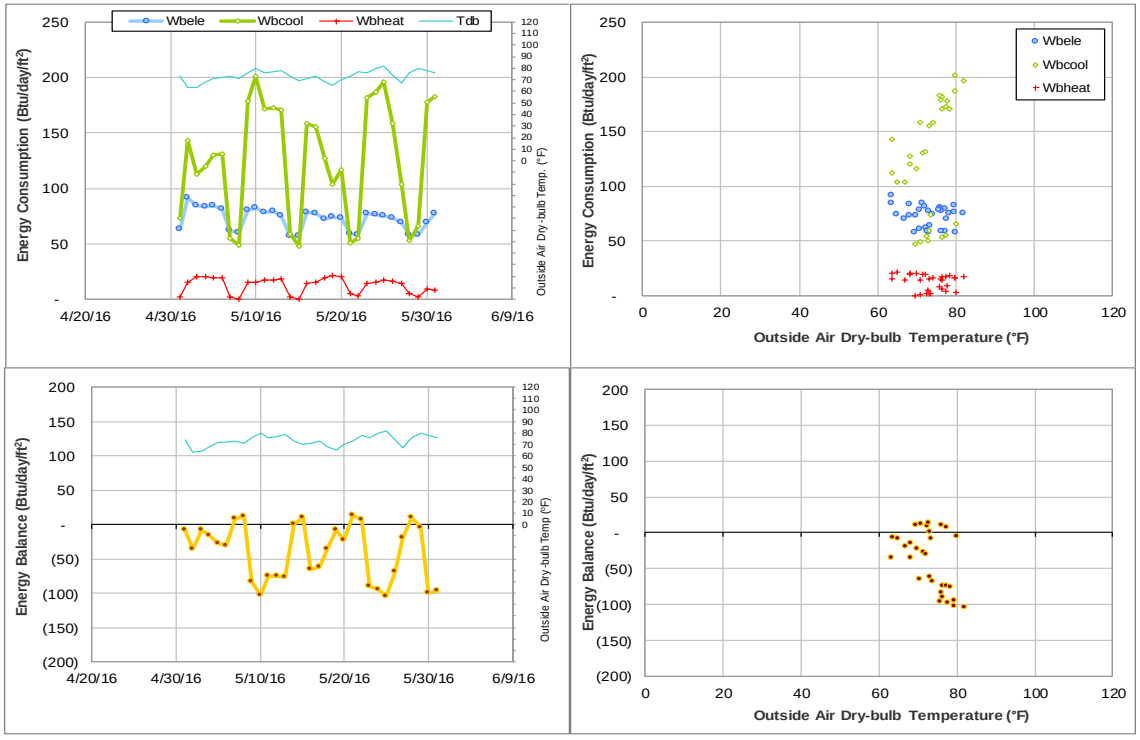


Figure IV-181 Allen Building TAMU BLDG # 1607 Energy Balance Plot during May 2016

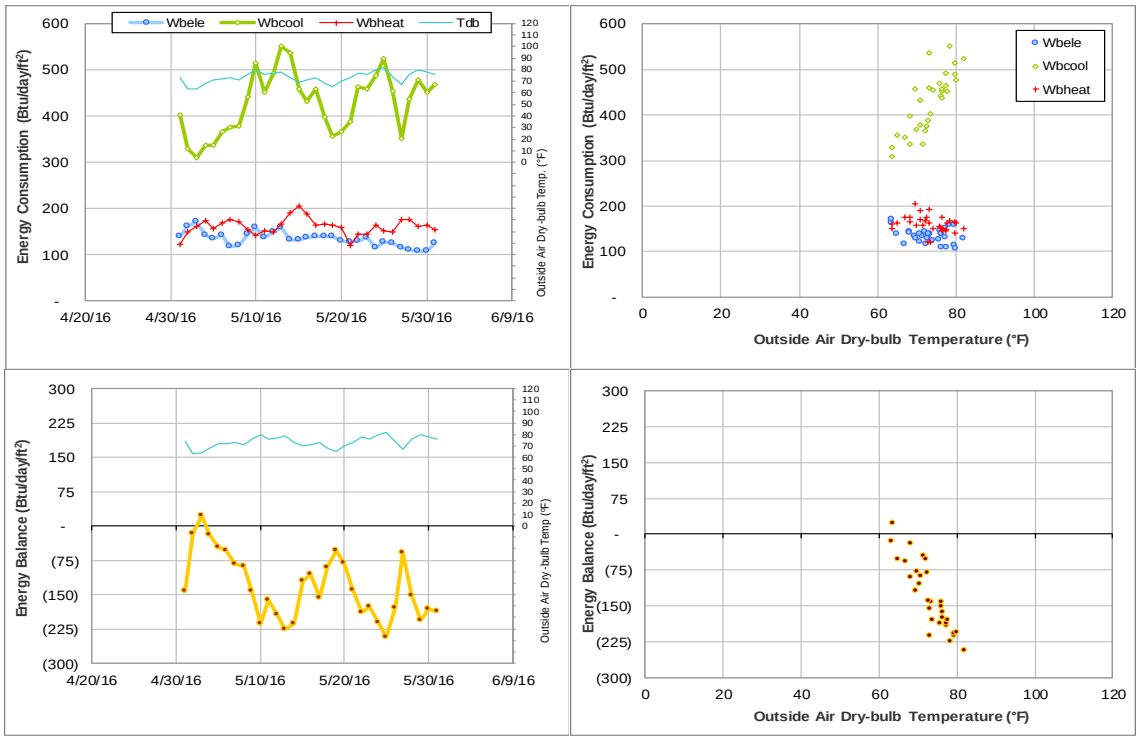


Figure IV-182 Annenberg Presidential Conference Center TAMU BLDG # 1608 Energy Balance Plot during May 2016

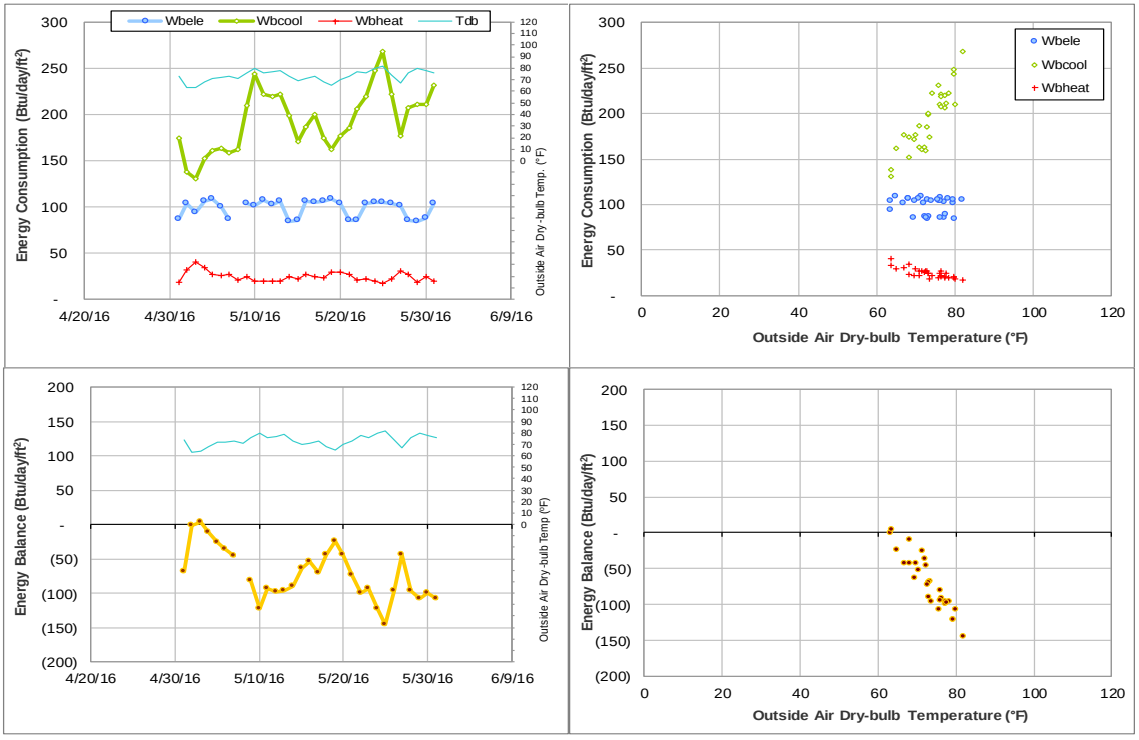


Figure IV-183 TTI Headquarters TAMU BLDG # 1609 Energy Balance Plot during May 2016

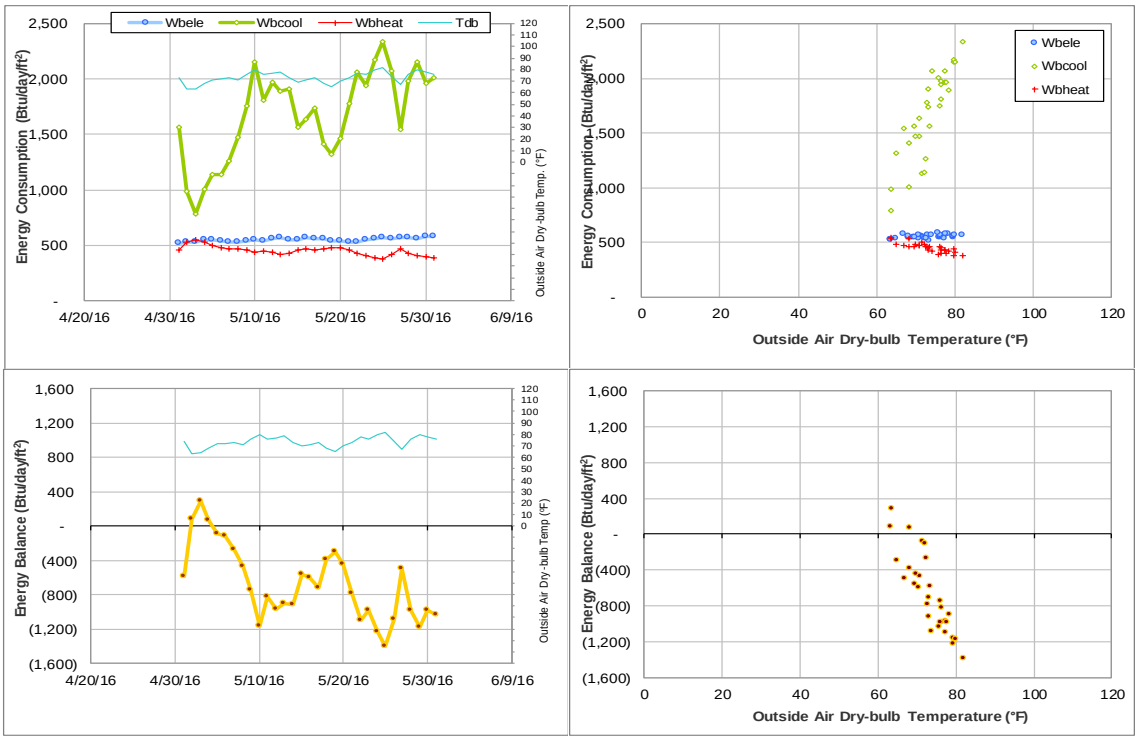


Figure IV-184 Engineering Research Building TAMU BLDG # 1611 Energy Balance Plot during May 2016

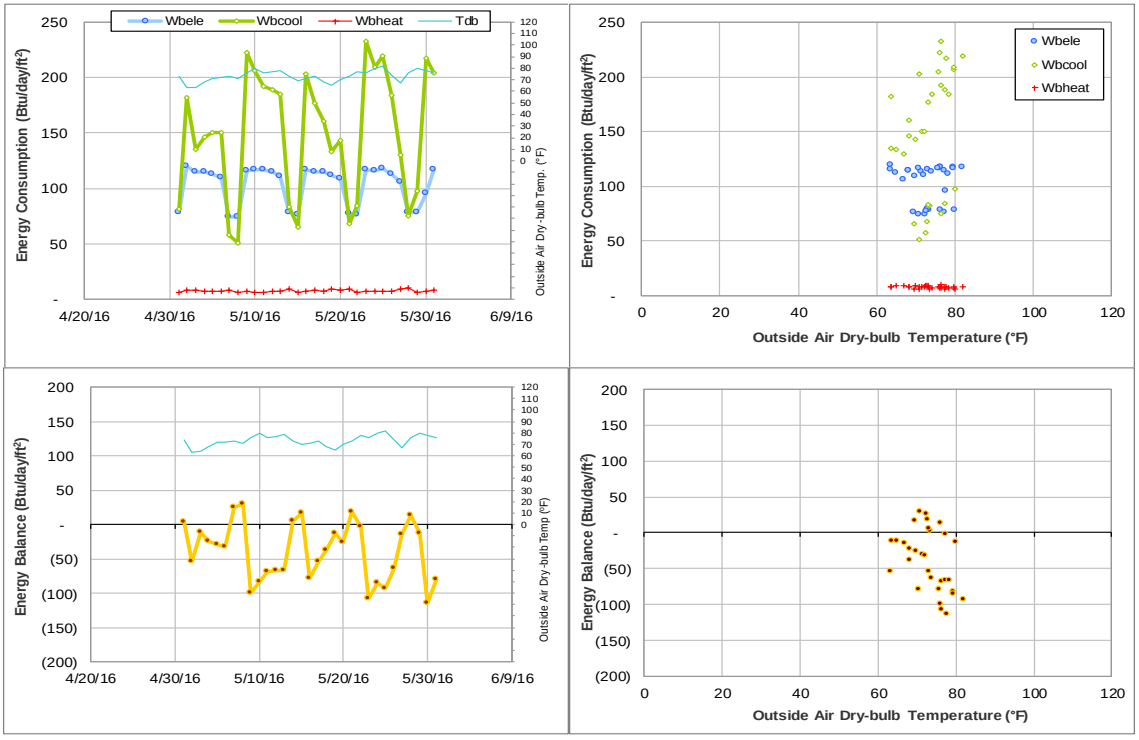


Figure IV-185 General Services Complex TAMU BLDG # 1800 Energy Balance Plot during May 2016

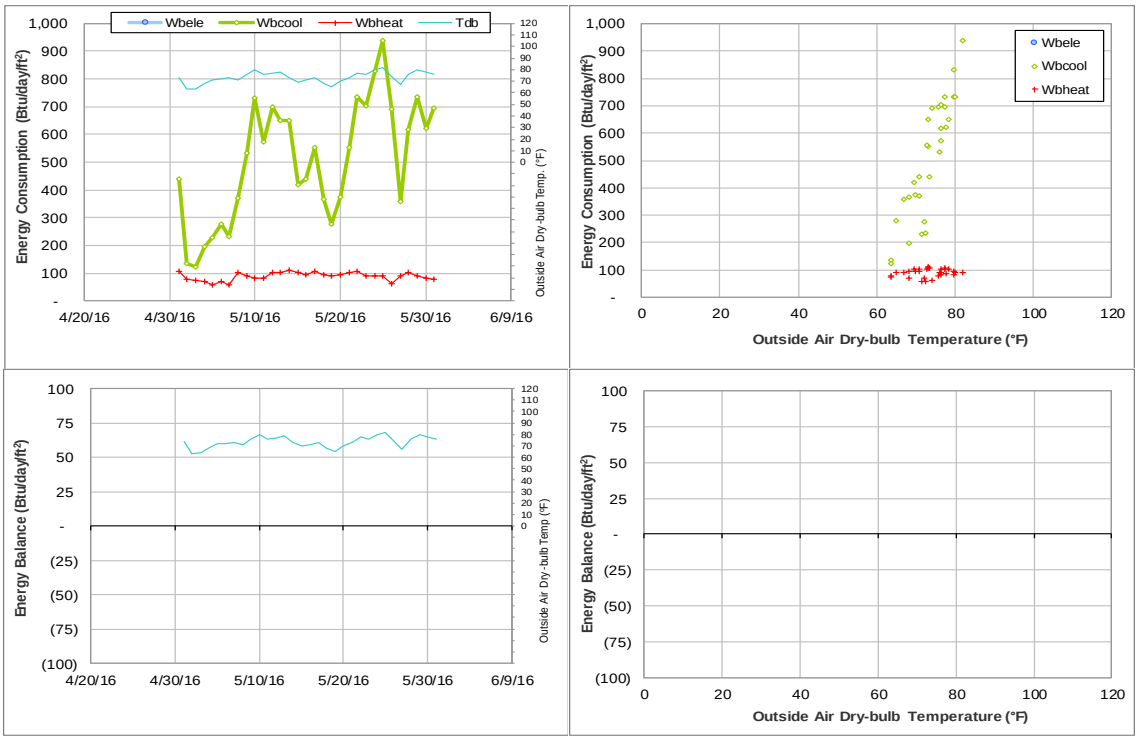


Figure IV-186 Office of the State Chemist Building TAMU BLDG # 1810 Energy Balance Plot during May 2016

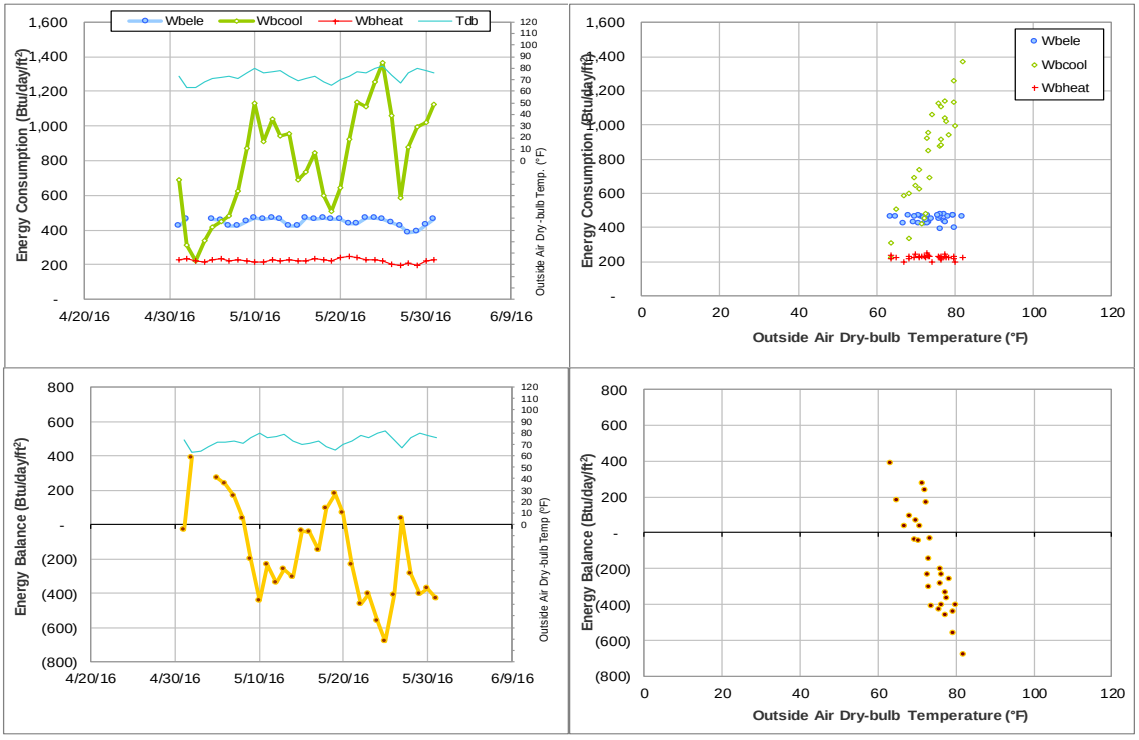


Figure IV-187 Vet Med Research Bldg Addition TAMU BLDG # 1811 Energy Balance Plot during May 2016

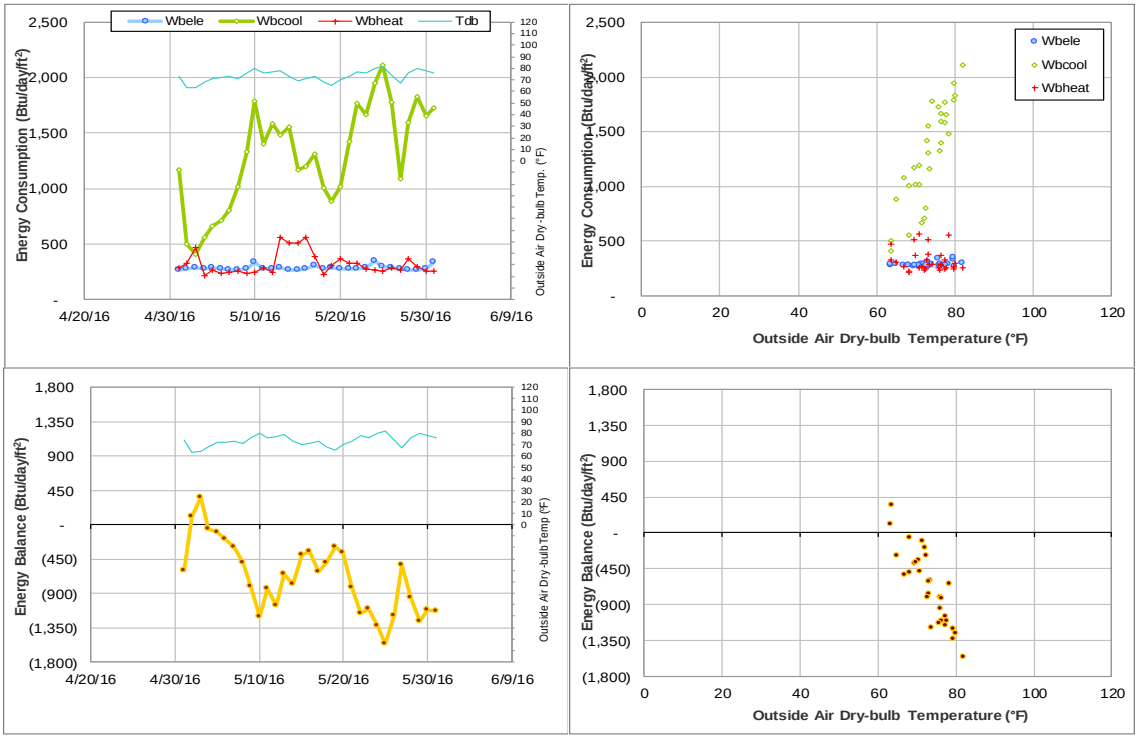


Figure IV-188 Texas Institute for Genomic Medicine TAMU BLDG # 1900 Energy Balance Plot during May 2016

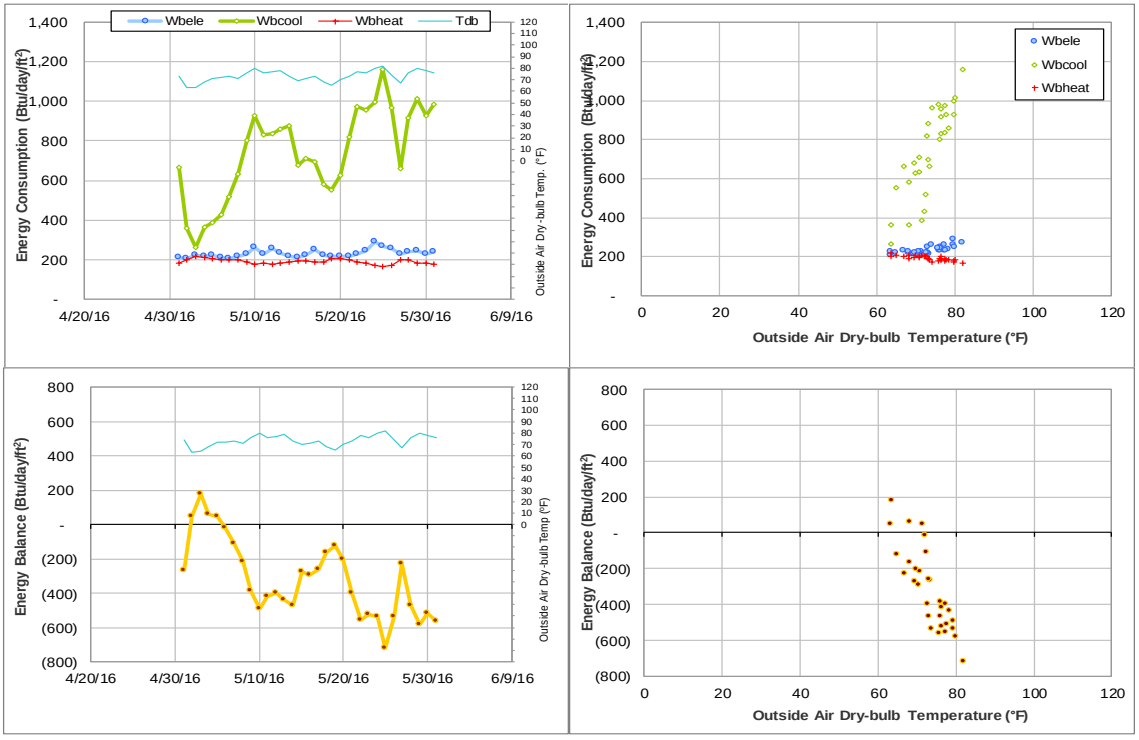


Figure IV-189 Texas A&M Institute for Preclinical Studies A TAMU BLDG # 1904 Energy Balance Plot during May 2016

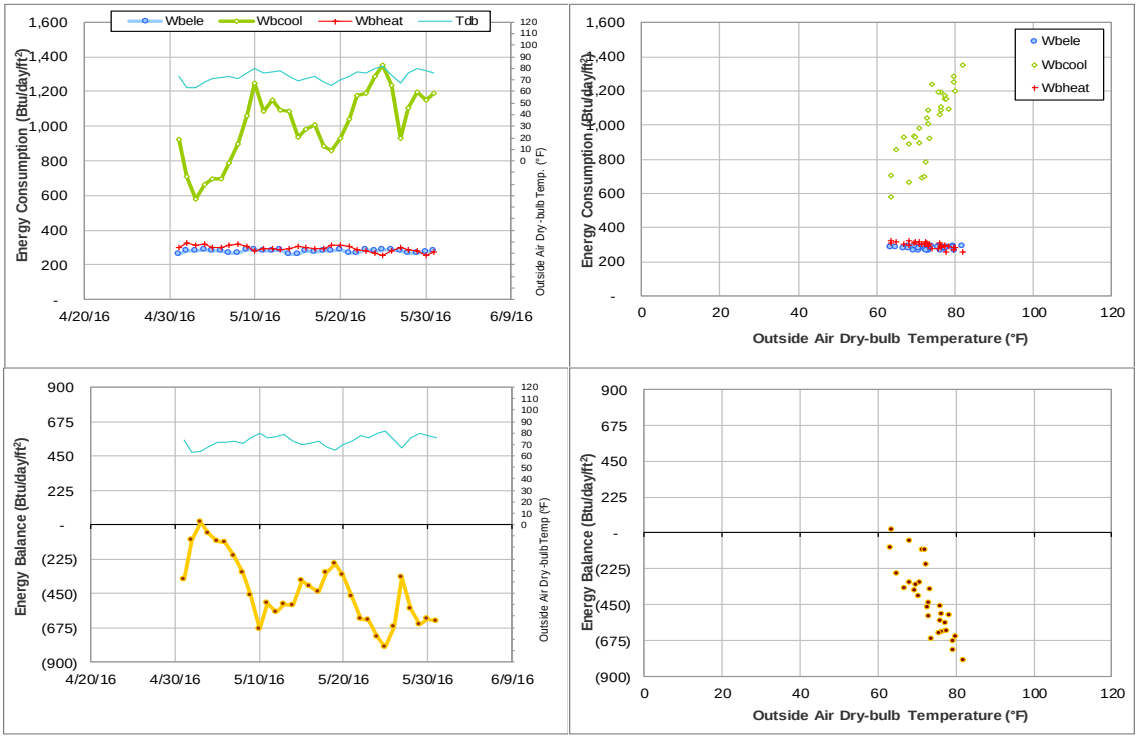


Figure IV-190 National Center for Therapeutics Manufacturing TAMU BLDG # 1910 Energy Balance Plot during May 2016

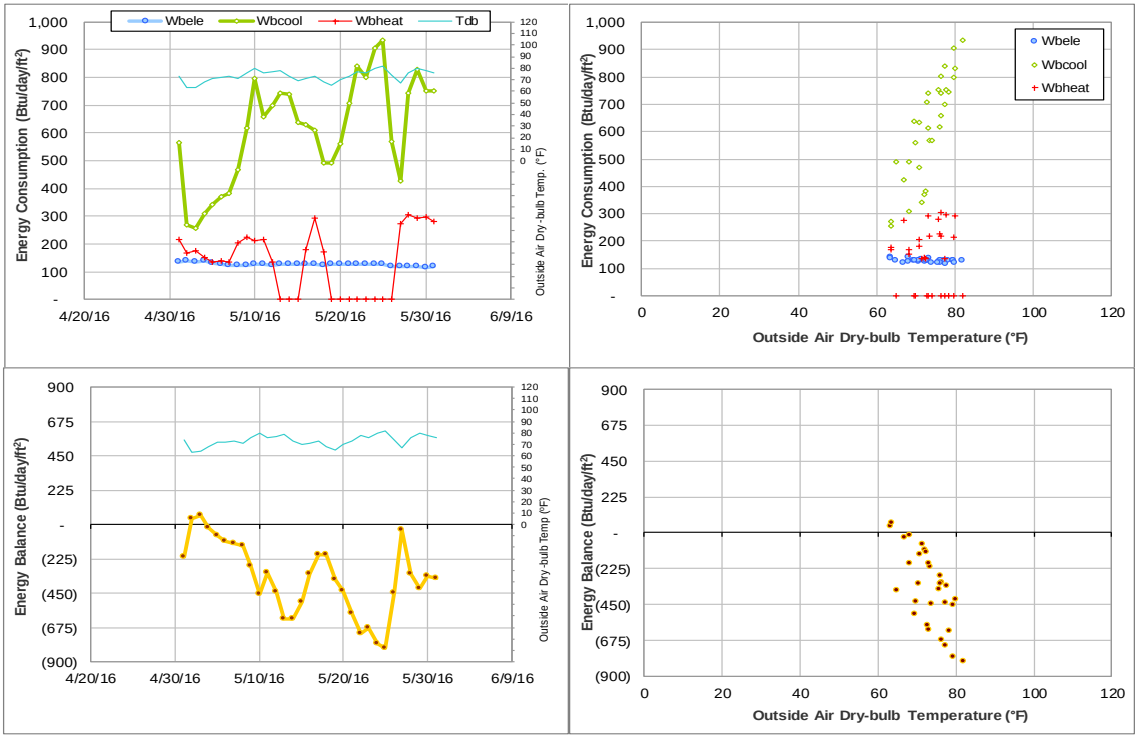


Figure IV-191 Multi-Species Research Building TAMU BLDG # 1911 Energy Balance Plot during May 2016

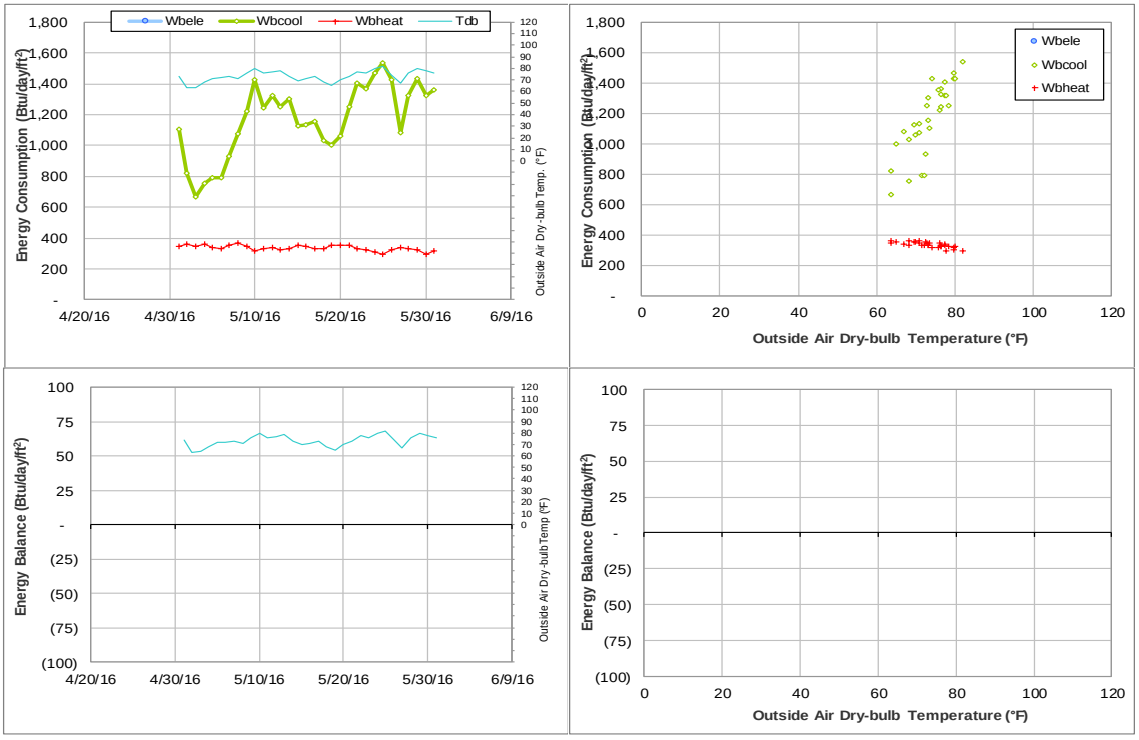


Figure IV-192 NCTM Manufacturing Building TAMU BLDG # 10226 Energy Balance Plot during May 2016

V. Energy Balance Plots with filled-in data for May 2016 Consumption

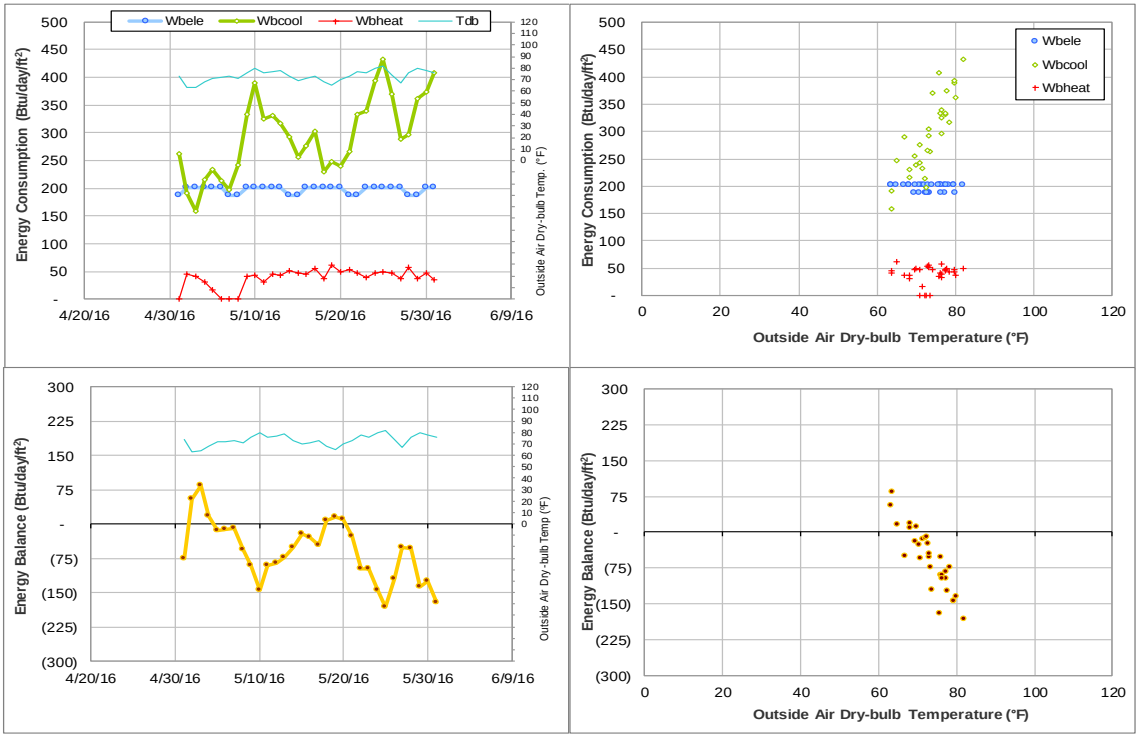


Figure V-1 Bright Football Complex TAMU BLDG # 361 Energy Balance Plot during May 2016

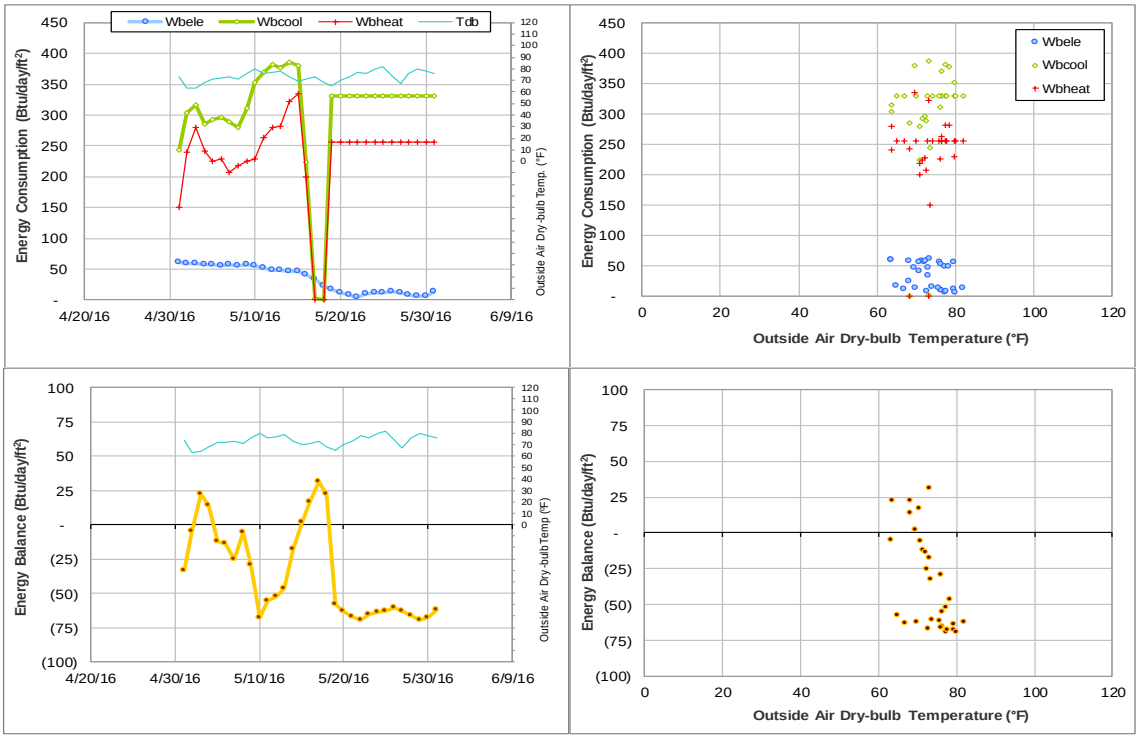


Figure V-2 Underwood Residence Hall TAMU BLDG # 394 Energy Balance Plot during May 2016

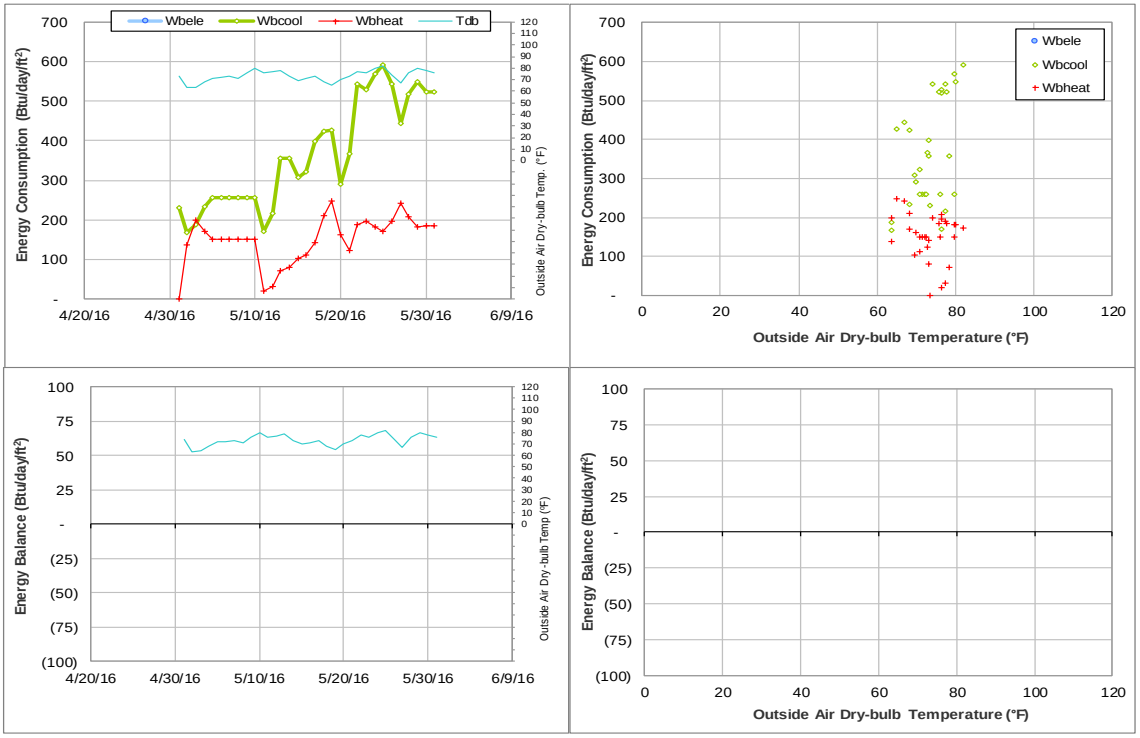


Figure V-3 Spence Hall Dorm 1 TAMU BLDG # 400 Energy Balance Plot during May 2016

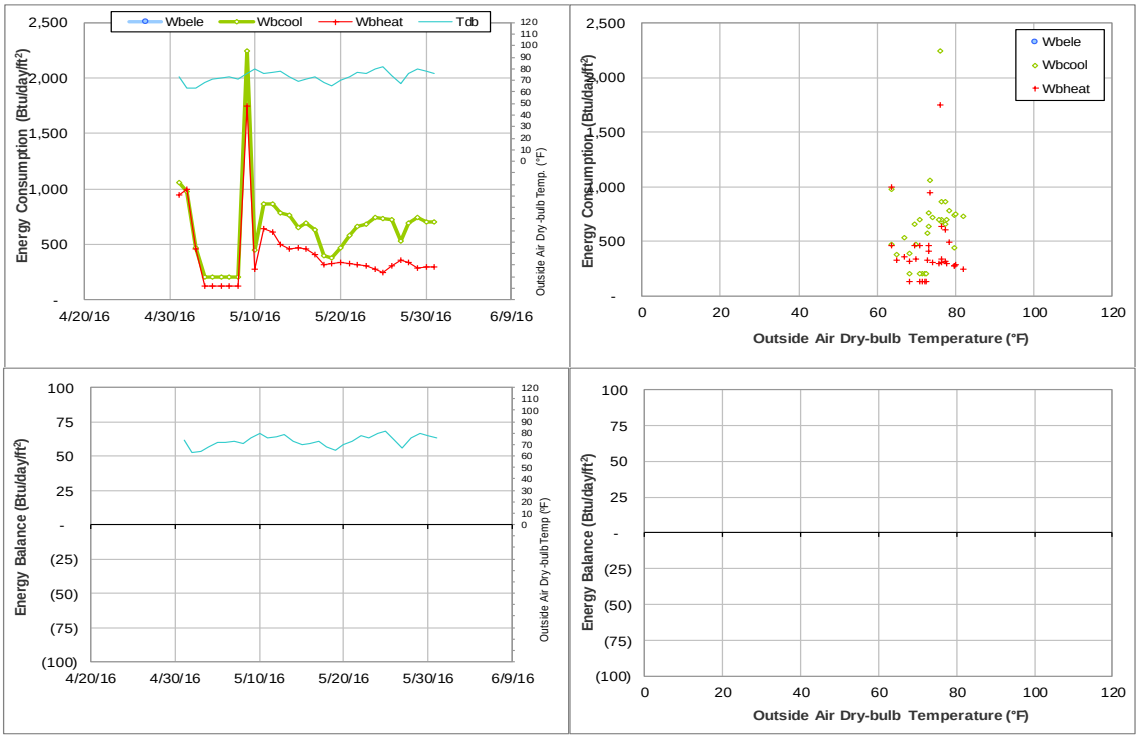


Figure V-4 Kiest Hall Dorm 2 TAMU BLDG # 401 Energy Balance Plot during May 2016

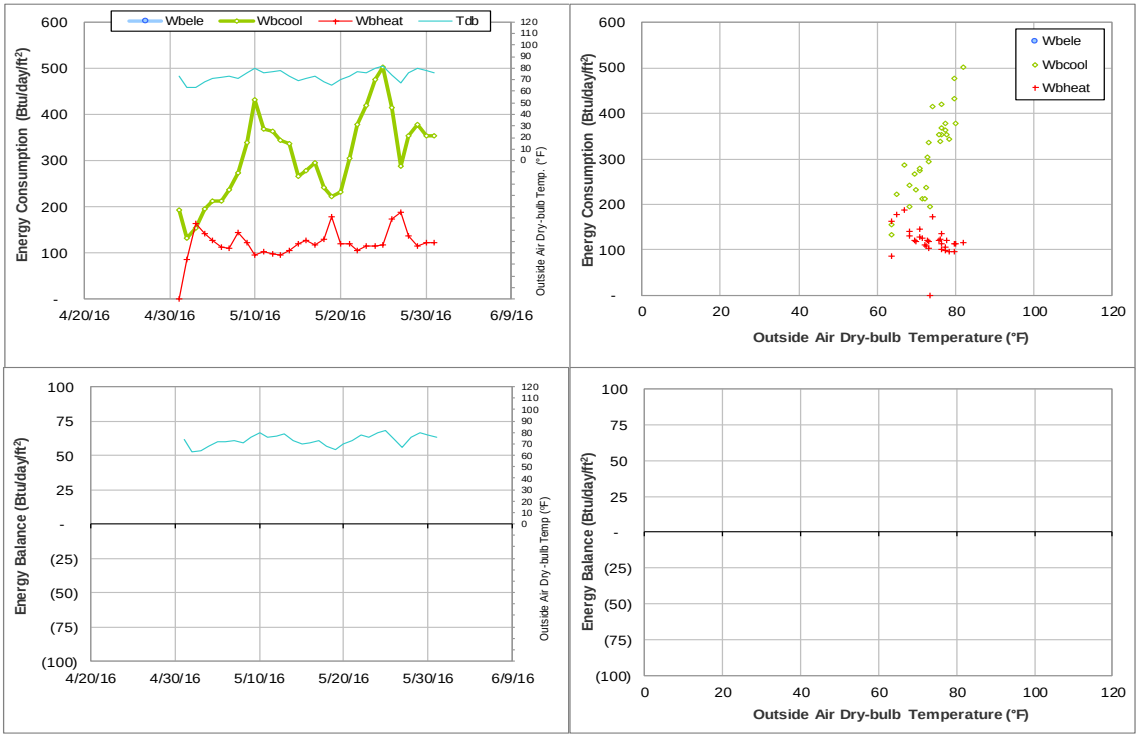


Figure V-5 Briggs Hall Dorm 3 TAMU BLDG # 402 Energy Balance Plot during May 2016

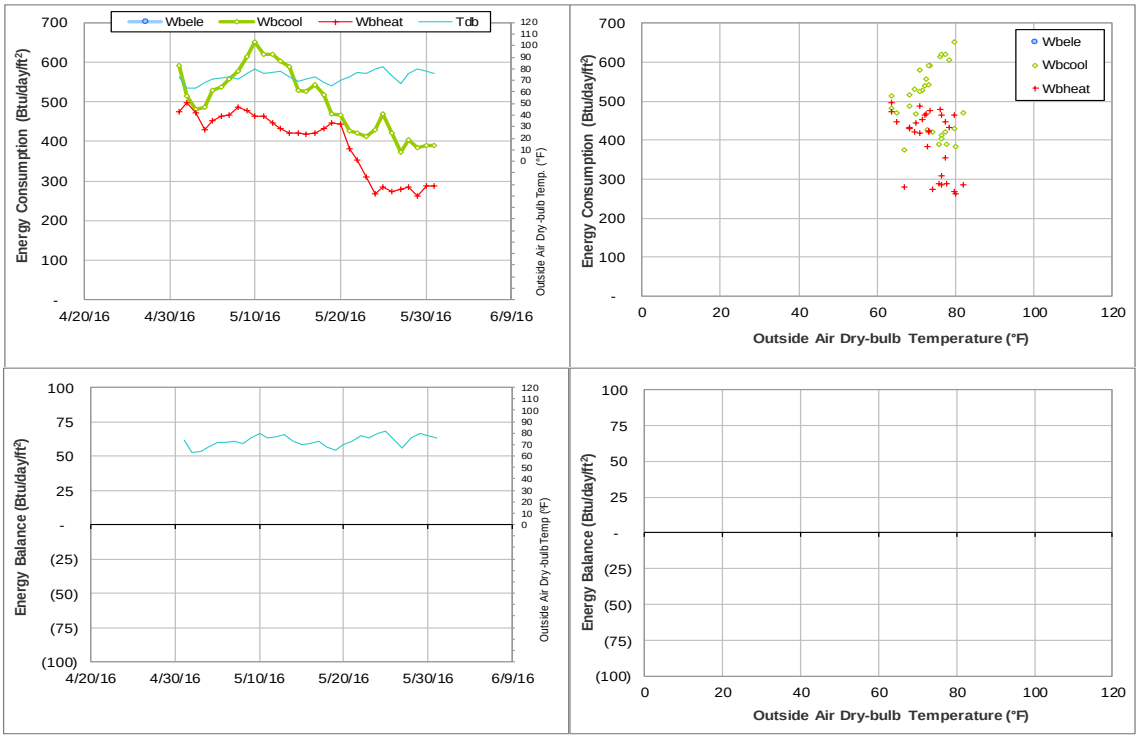


Figure V-6 Fountain Hall Dorm 4 TAMU BLDG # 403 Energy Balance Plot during May 2016

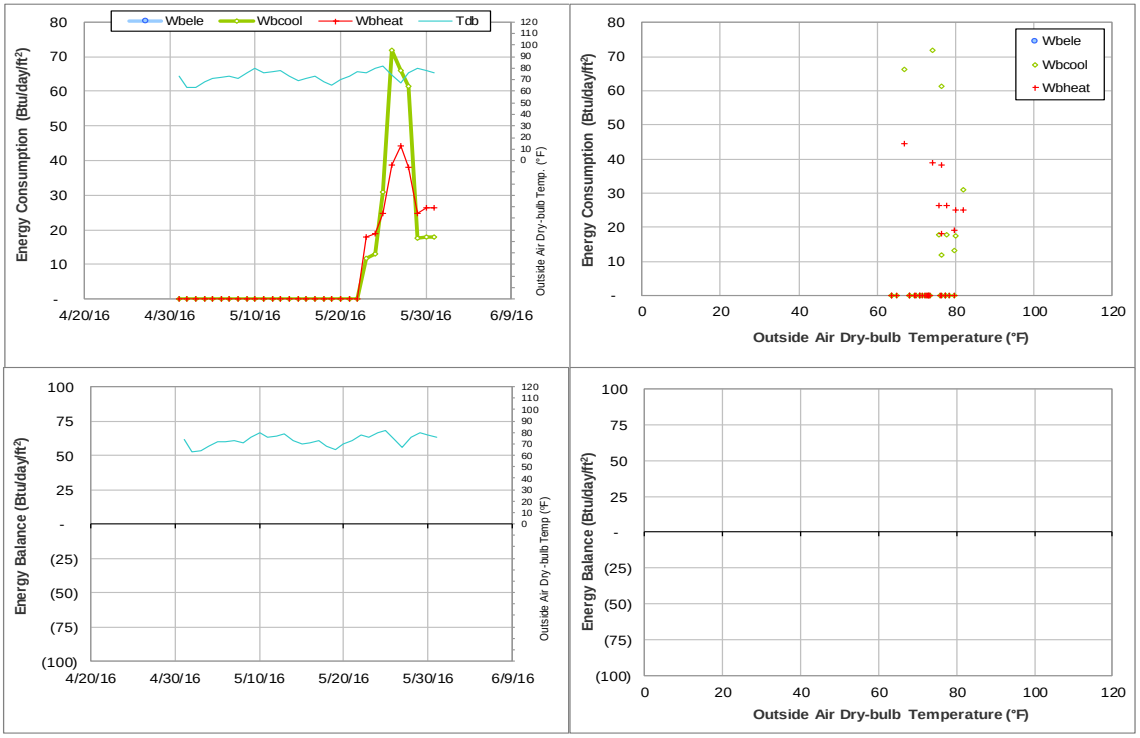


Figure V-7 Gainer Hall Dorm 5 TAMU BLDG # 404 Energy Balance Plot during May 2016

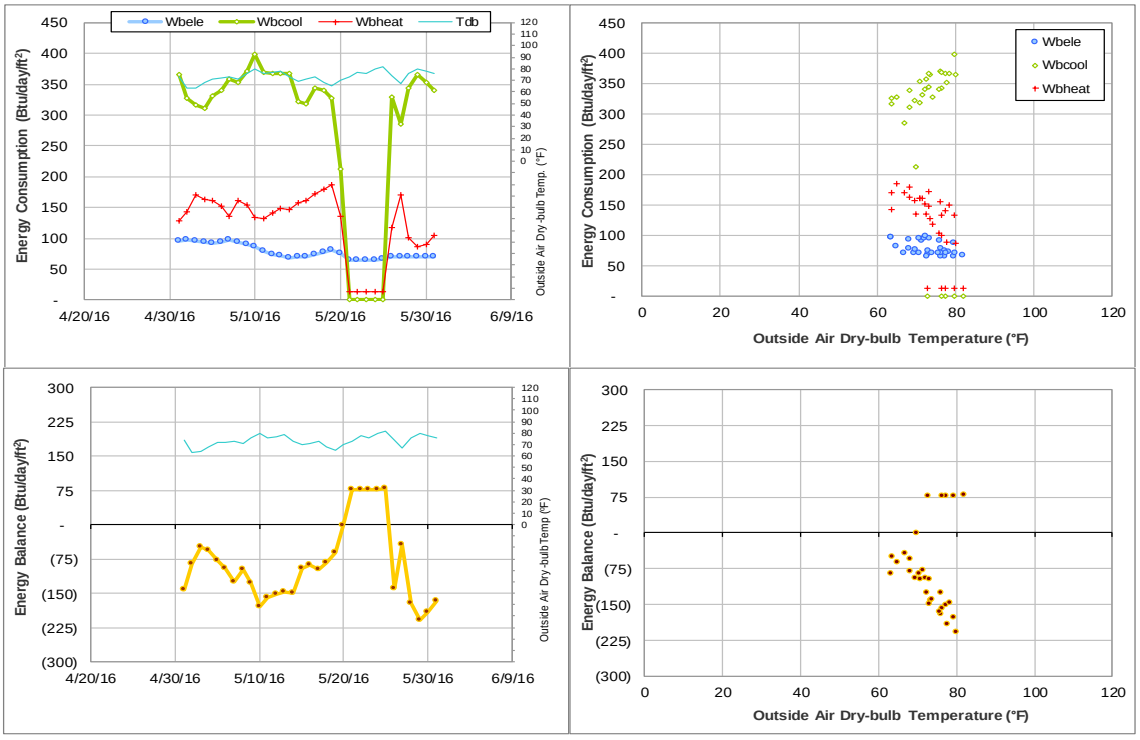


Figure V-8 Whitely Hall - Dorm 9 TAMU BLDG # 408 Energy Balance Plot during May 2016

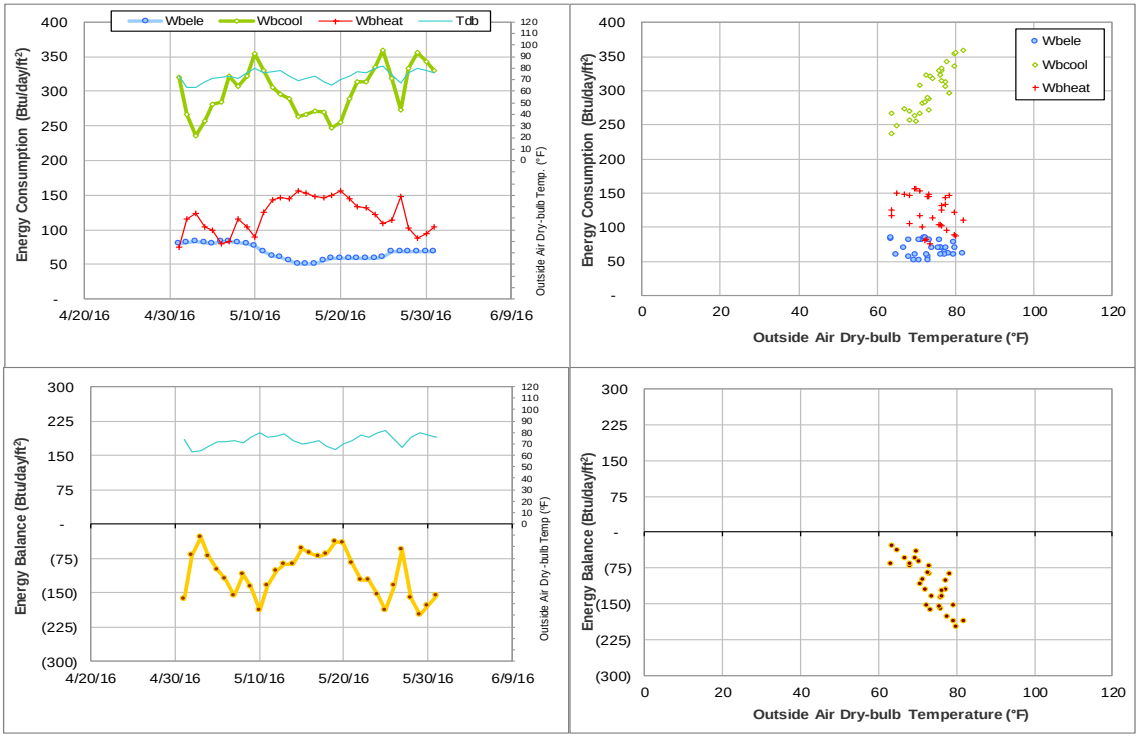


Figure V-9 White Hall - Dorm 10 TAMU BLDG # 409 Energy Balance Plot during May 2016

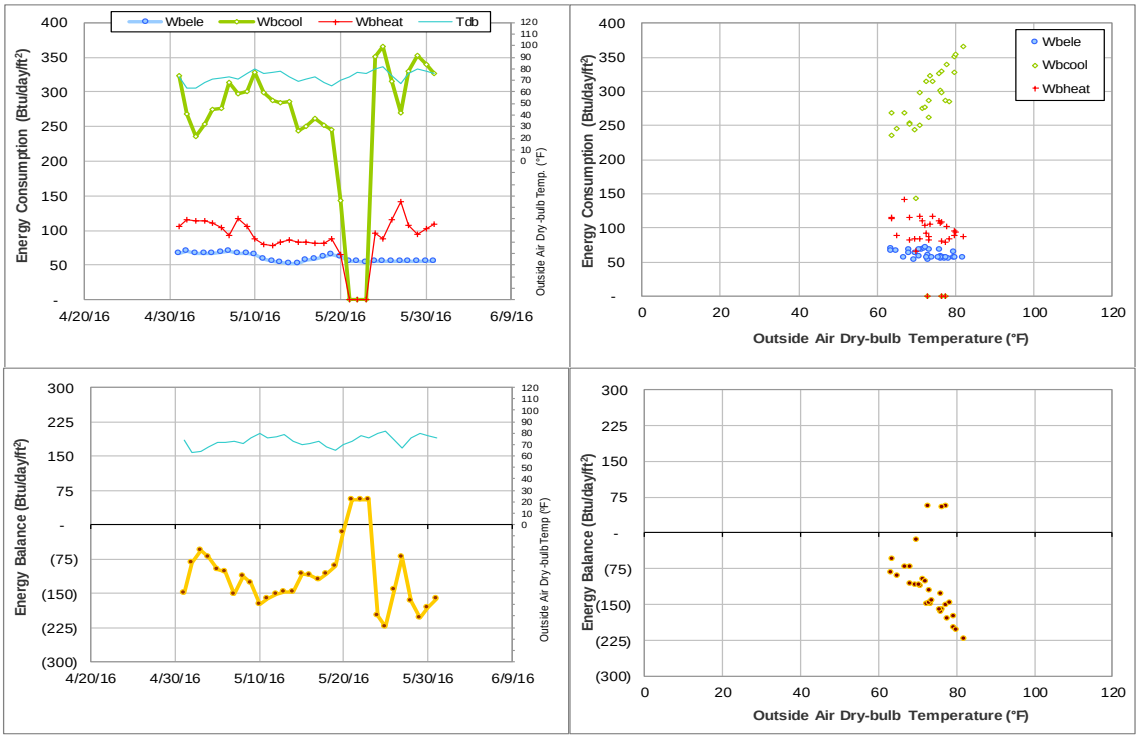


Figure V-10 Harrington Hall - Dorm 11 TAMU BLDG # 410 Energy Balance Plot during May 2016

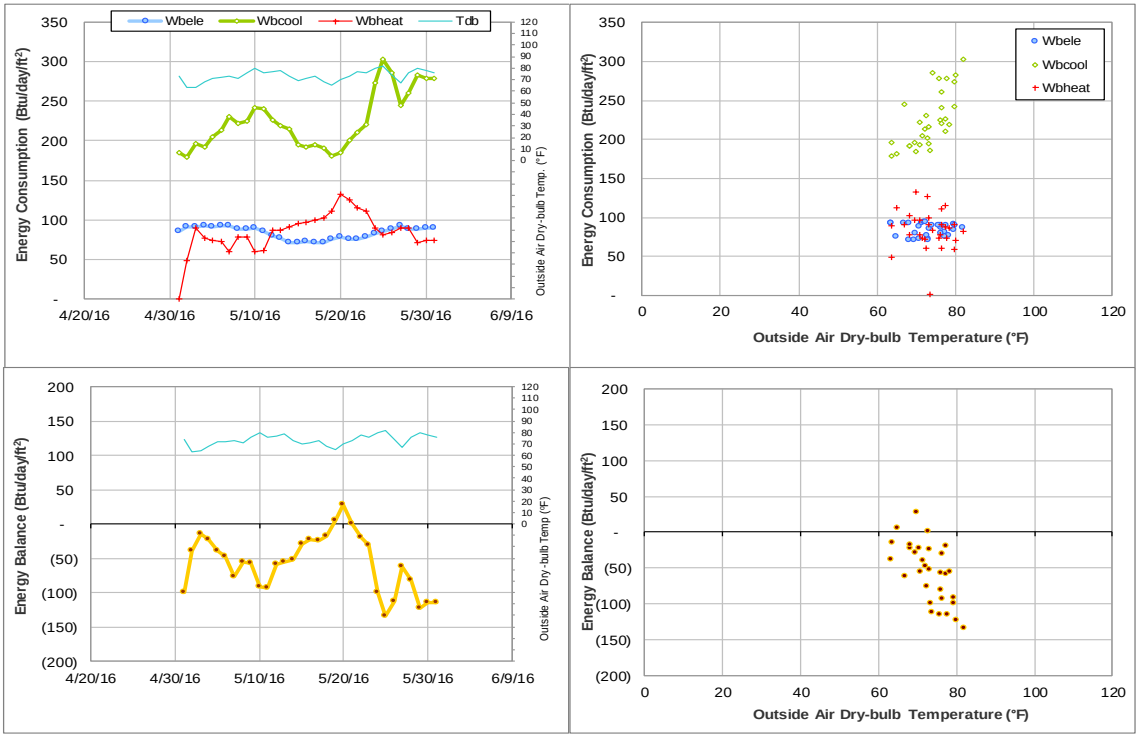


Figure V-11 Utay Hall - Dorm 12 TAMU BLDG # 411 Energy Balance Plot during May 2016

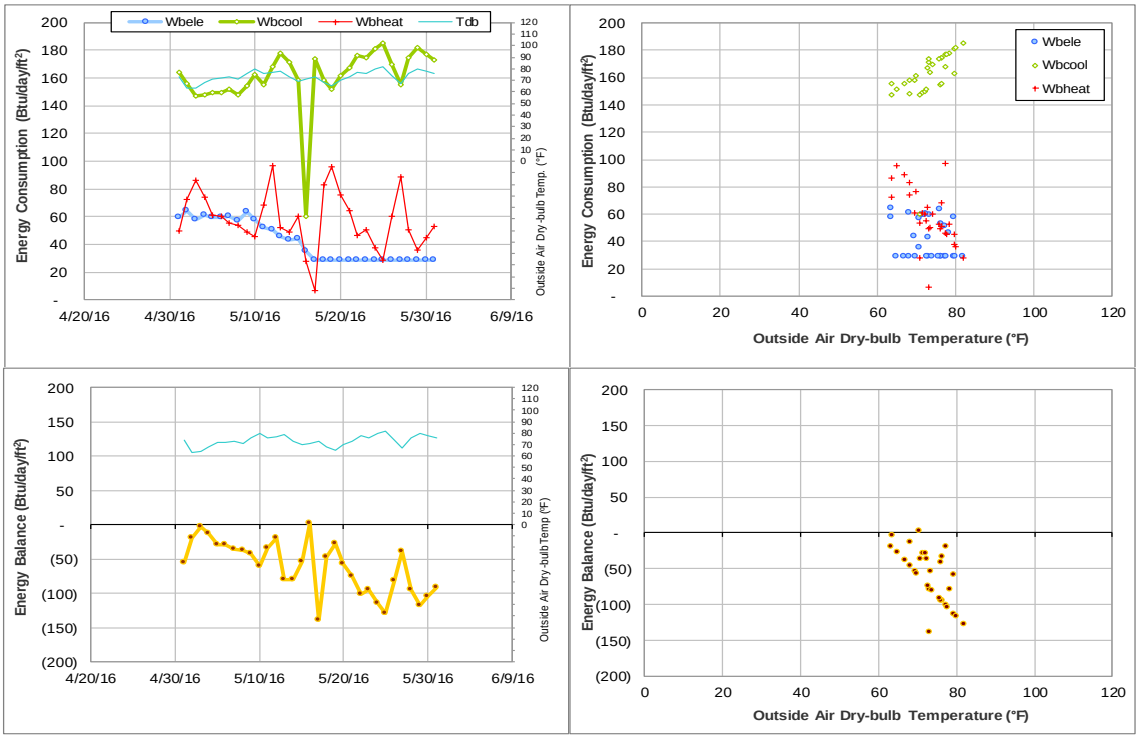


Figure V-12 Legett Residence Hall TAMU BLDG # 419 Energy Balance Plot during May 2016

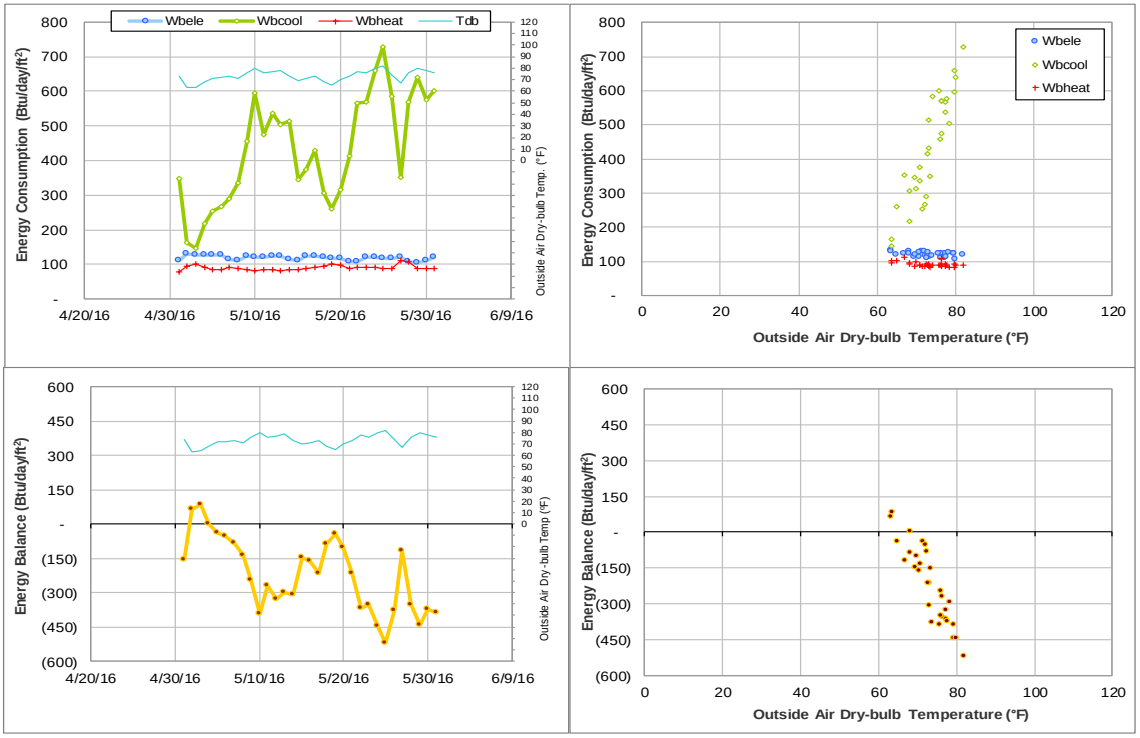


Figure V-13 Reed-McDonald and Engineering Innovation Center TAMU BLDG # 436 Energy Balance Plot during May 2016

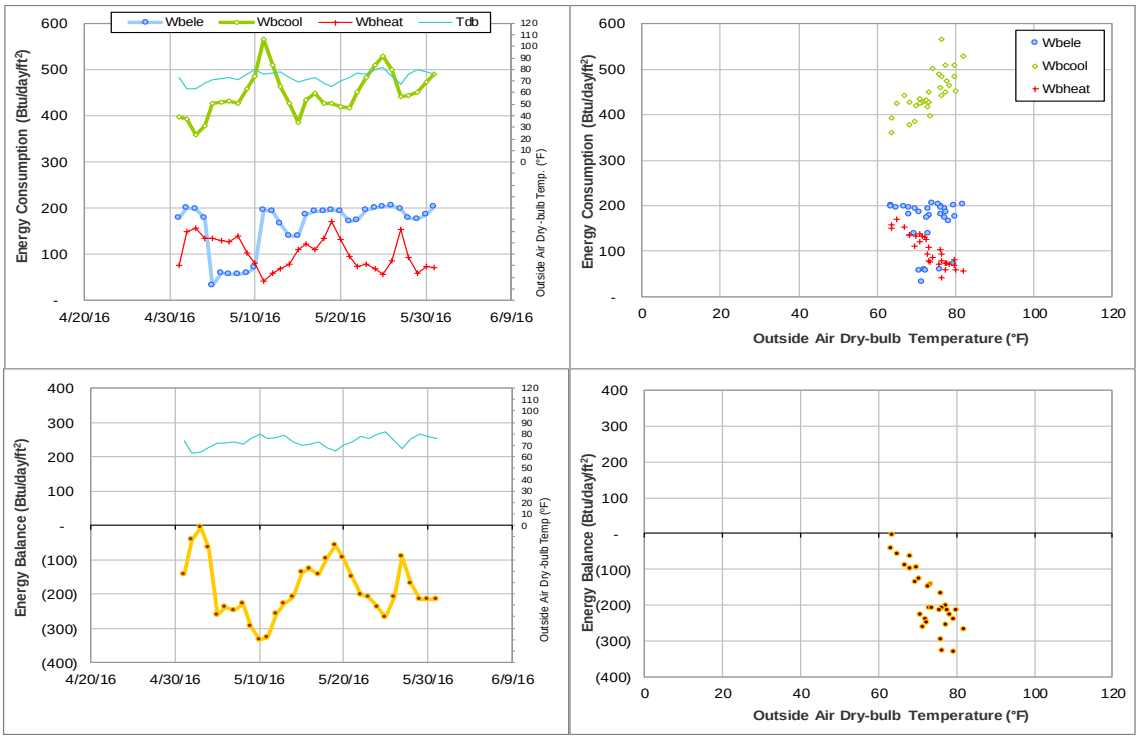


Figure V-14 Peterson Building TAMU BLDG # 444 Energy Balance Plot during May 2016

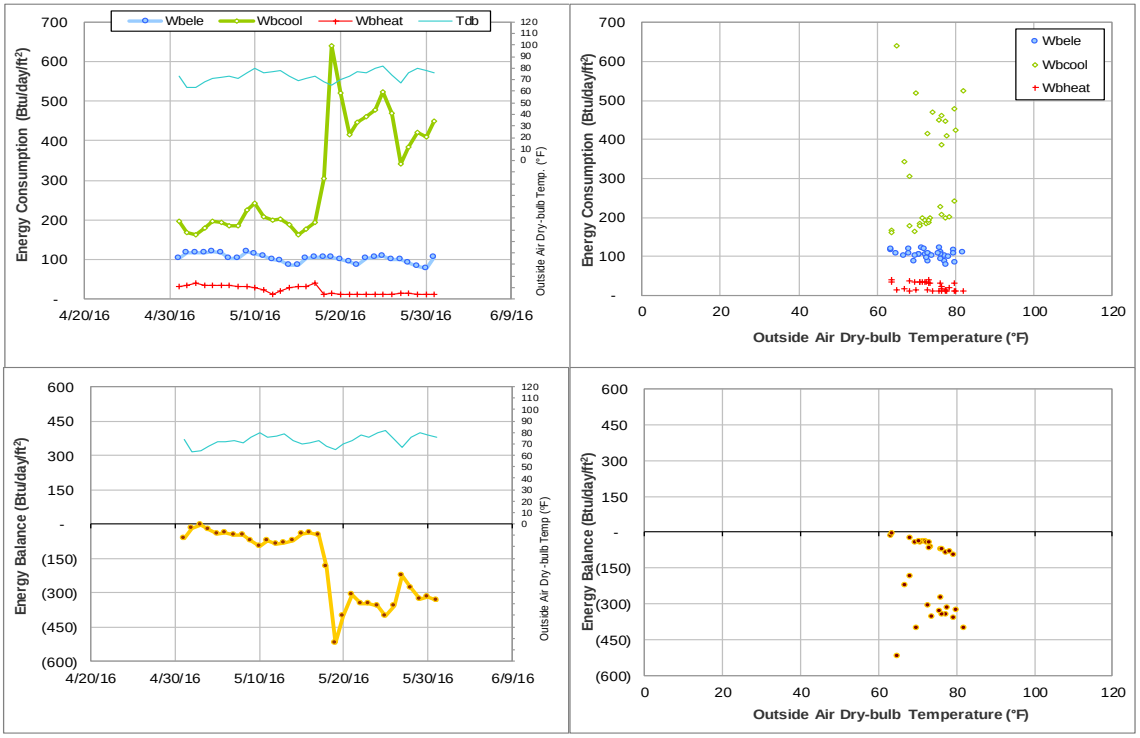


Figure V-15 Evans Library TAMU BLDG # 468 Energy Balance Plot during May 2016

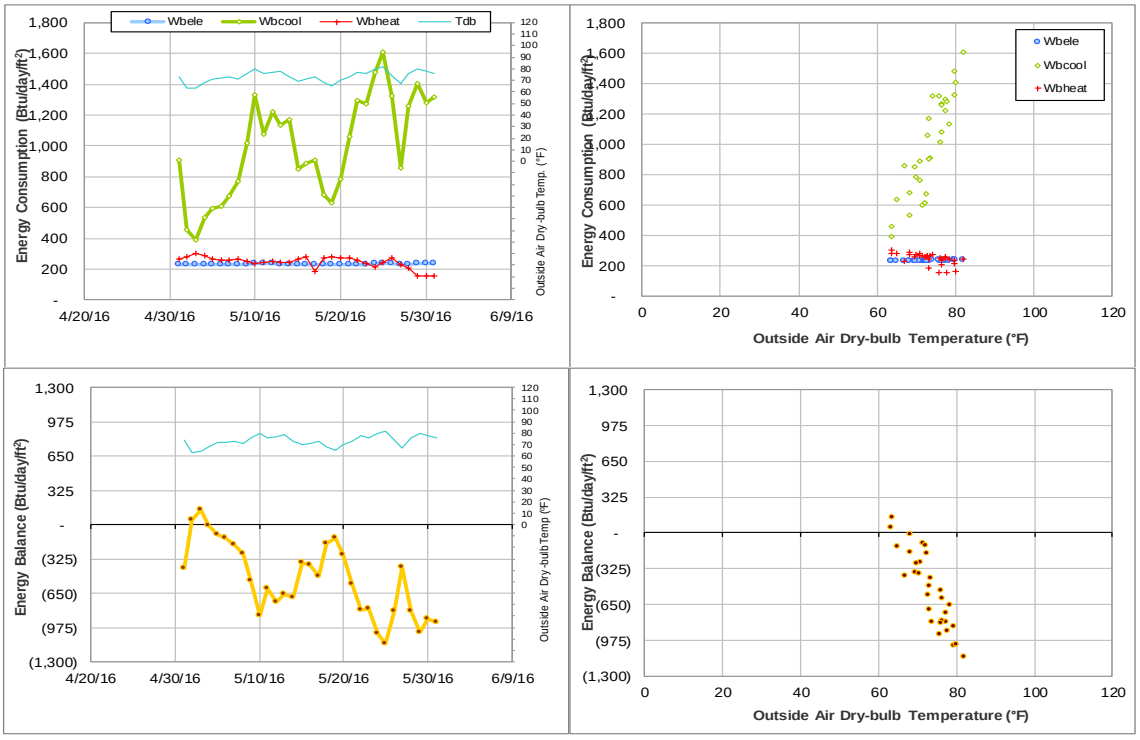


Figure V-16 Chemistry Building TAMU BLDG # 484 Energy Balance Plot during May 2016

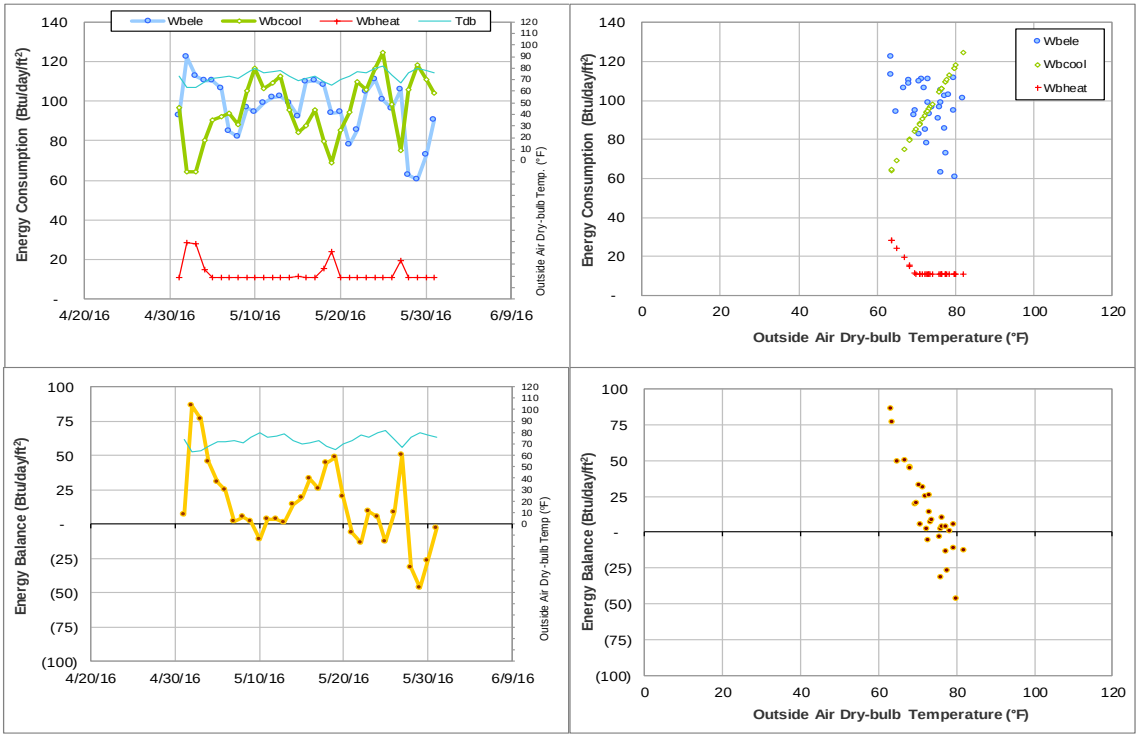


Figure V-17 Engineering Innovation Center TAMU BLDG # 499 Energy Balance Plot during May 2016

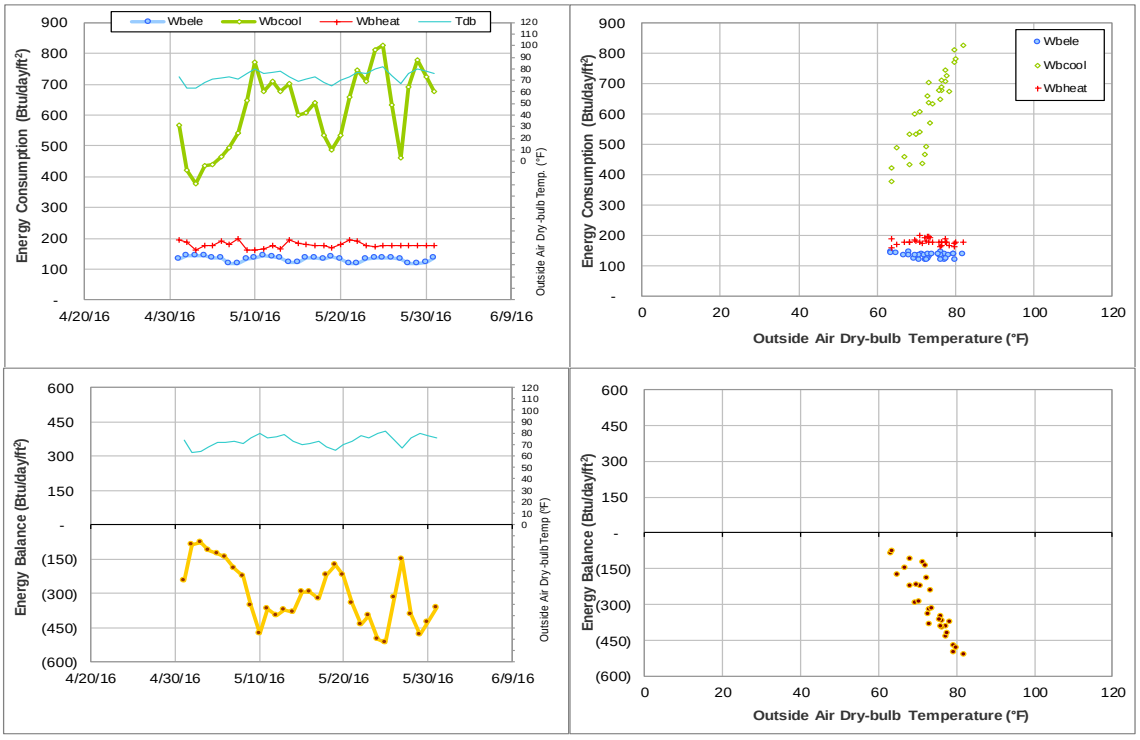


Figure V-18 Veterinary Medical Science Building TAMU BLDG # 507 Energy Balance Plot during May 2016

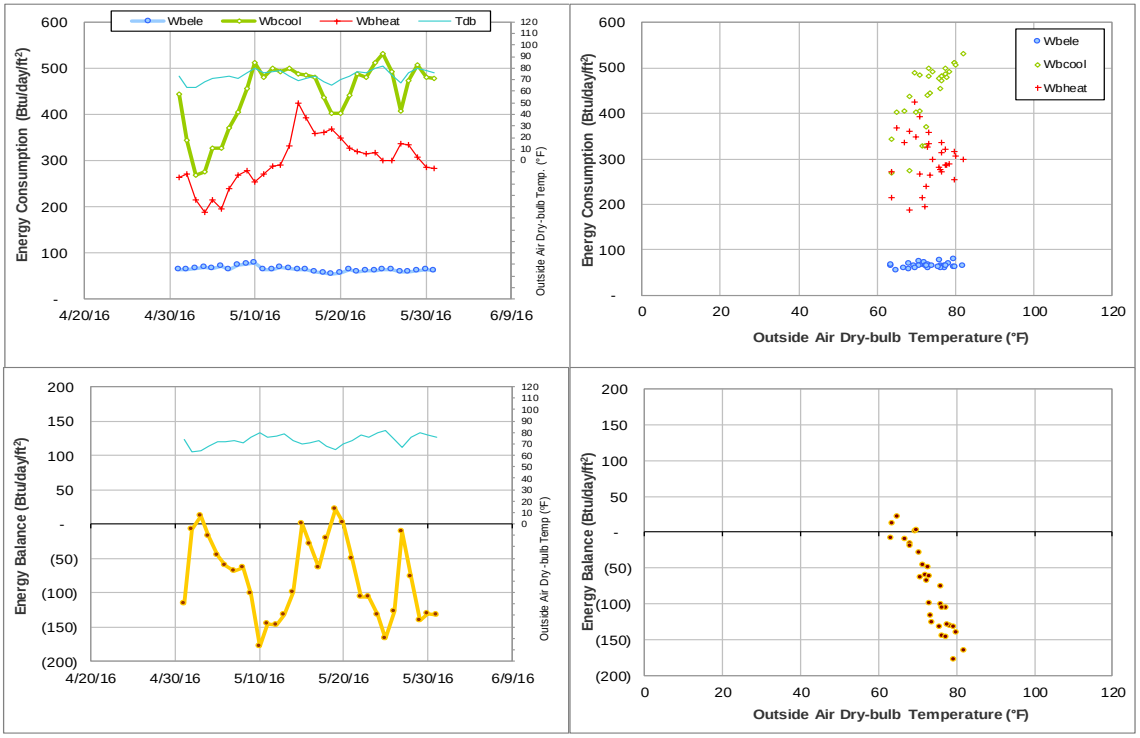


Figure V-19 Haas Residence Hall TAMU BLDG # 549 Energy Balance Plot during May 2016

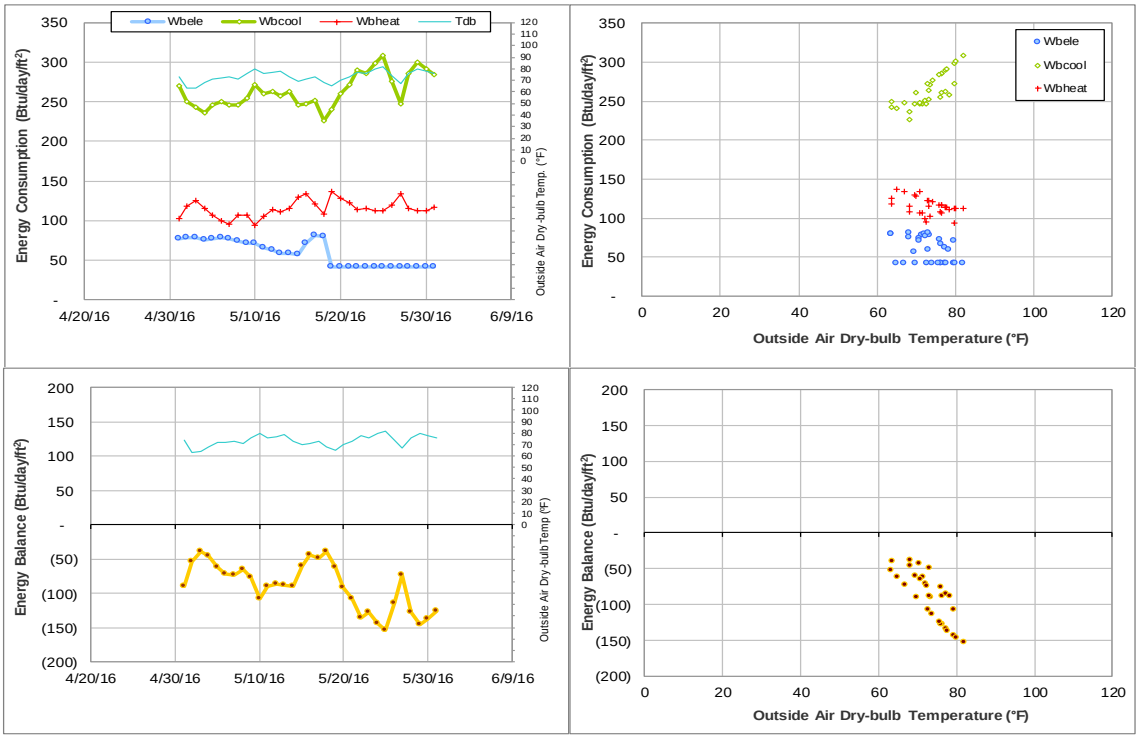


Figure V-20 Neeley Residence Hall TAMU BLDG # 652 Energy Balance Plot during May 2016

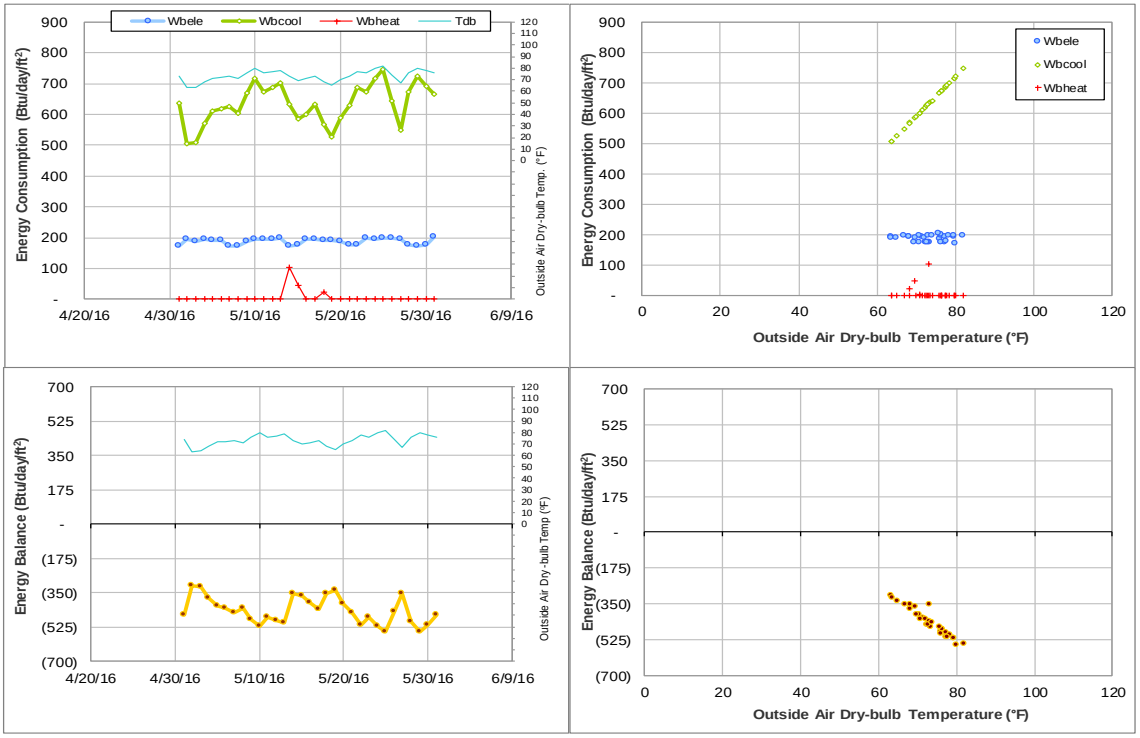


Figure V-21 Vivarium III TAMU BLDG # 1020 Energy Balance Plot during May 2016

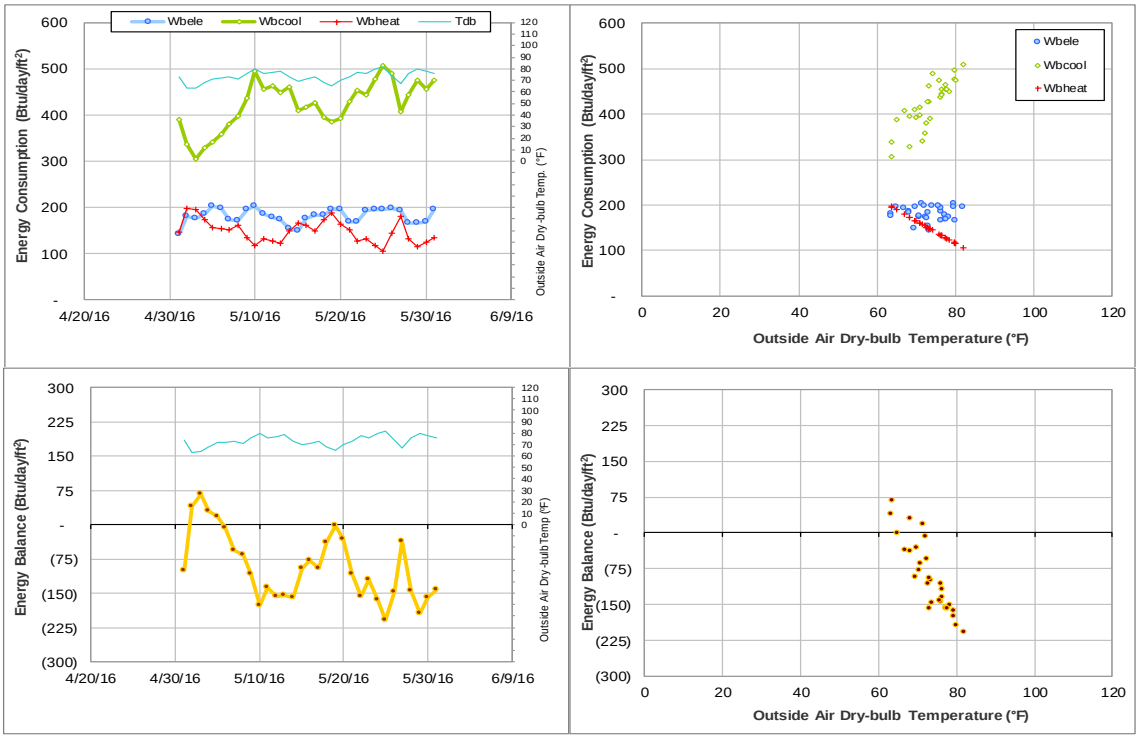


Figure V-22 Veterinary Medicine Administration TAMU BLDG # 1026 Energy Balance Plot during May 2016

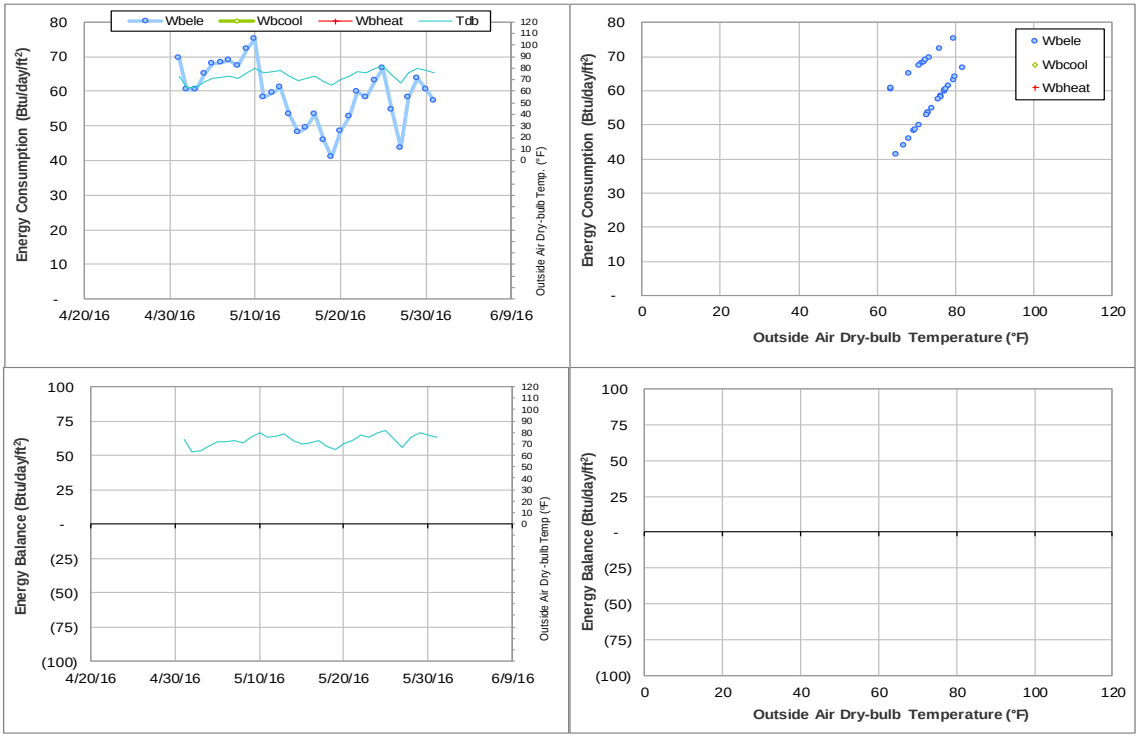


Figure V-23 University Apartments - The Gardens F TAMU BLDG # 1454 Energy Balance Plot during May 2016

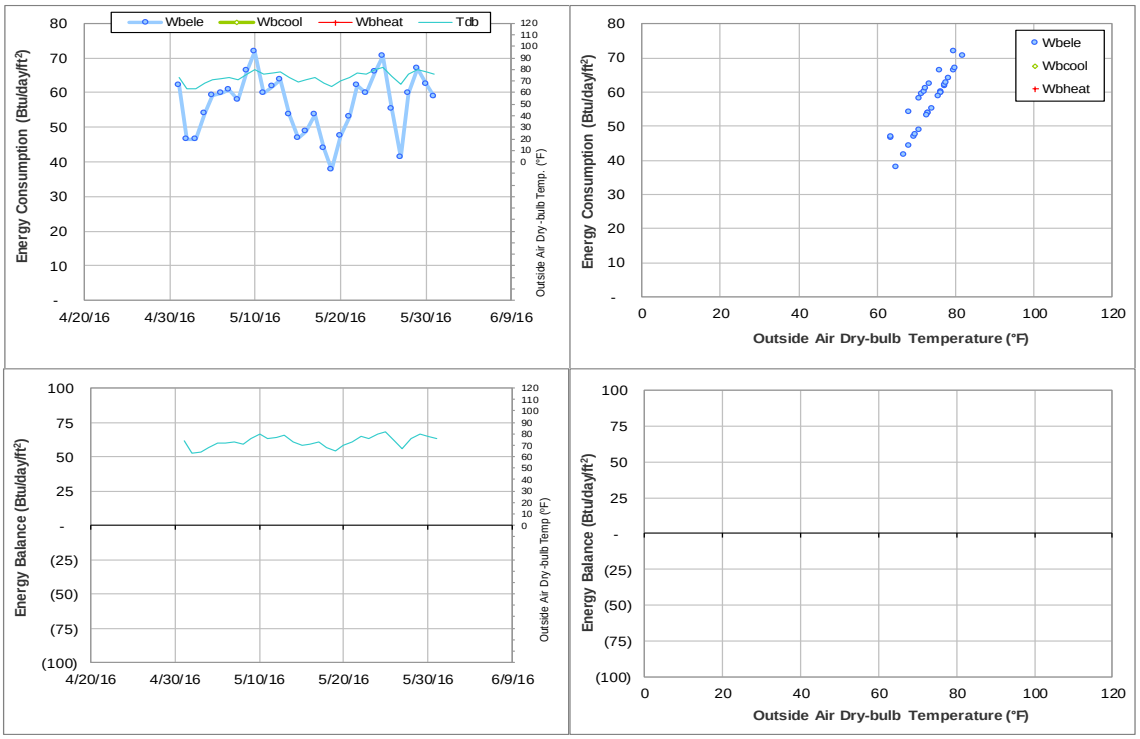


Figure V-24 University Apartments - The Gardens G TAMU BLDG # 1455 Energy Balance Plot during May 2016

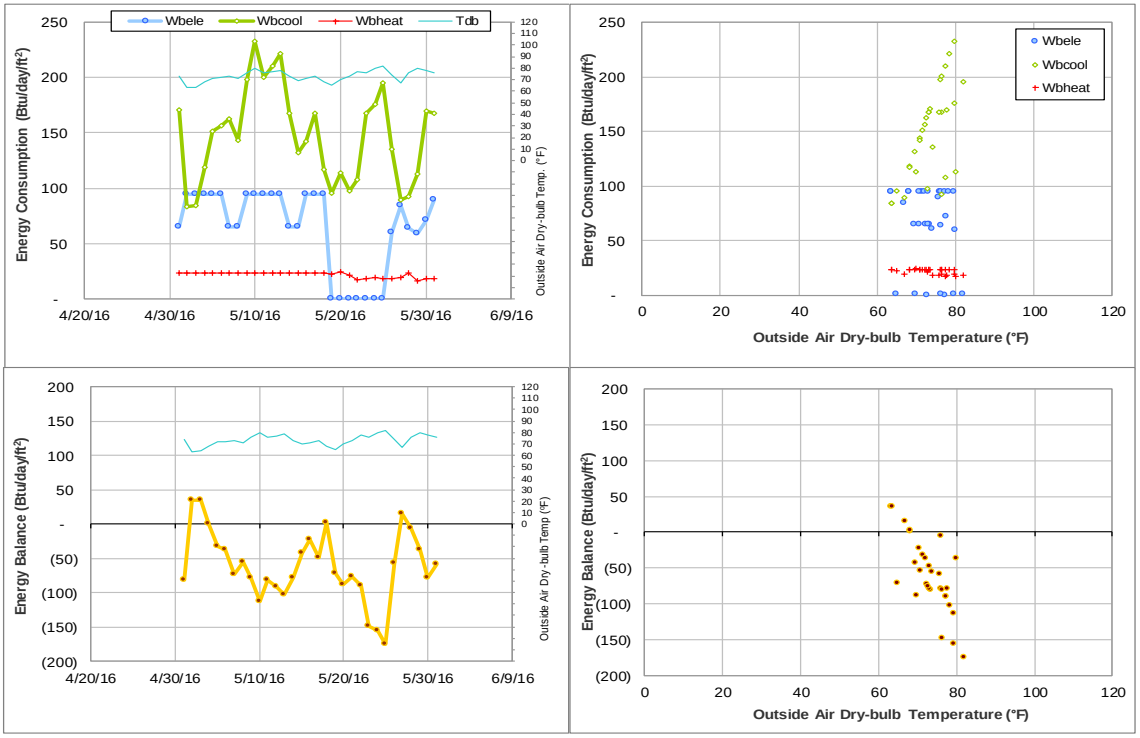


Figure V-25 Gilchrist TTI Building TAMU BLDG # 1600 Energy Balance Plot during May 2016

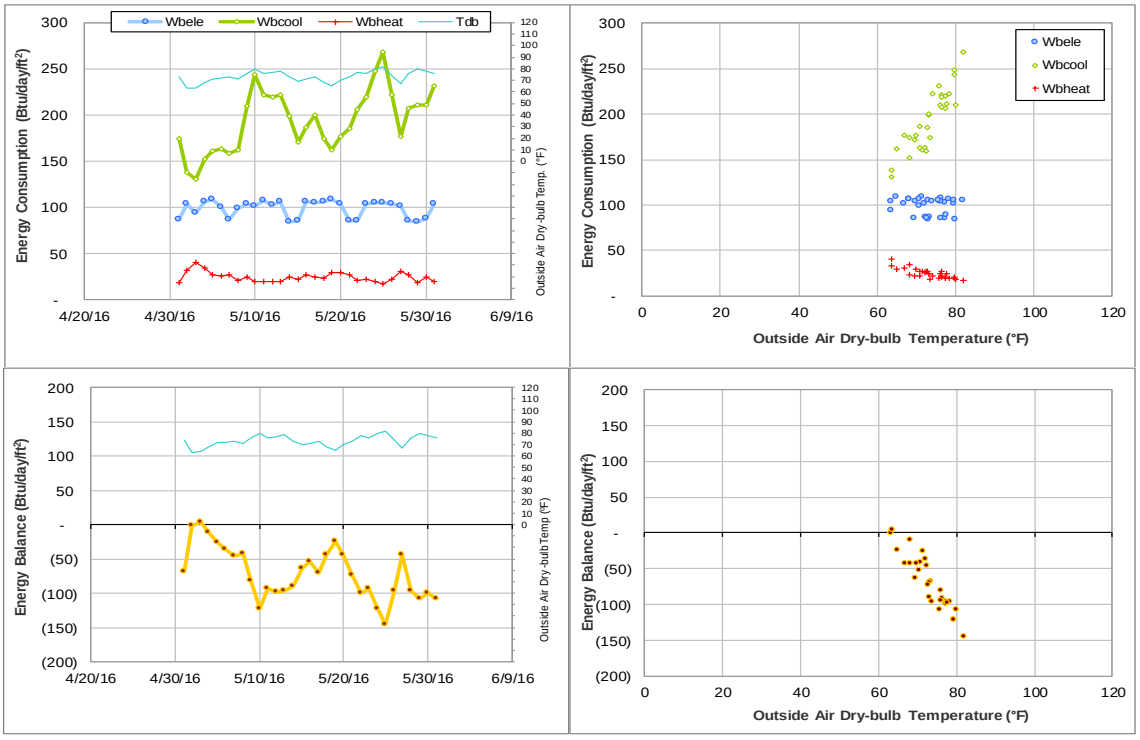


Figure V-26 TTI Headquarters TAMU BLDG # 1609 Energy Balance Plot during May 2016

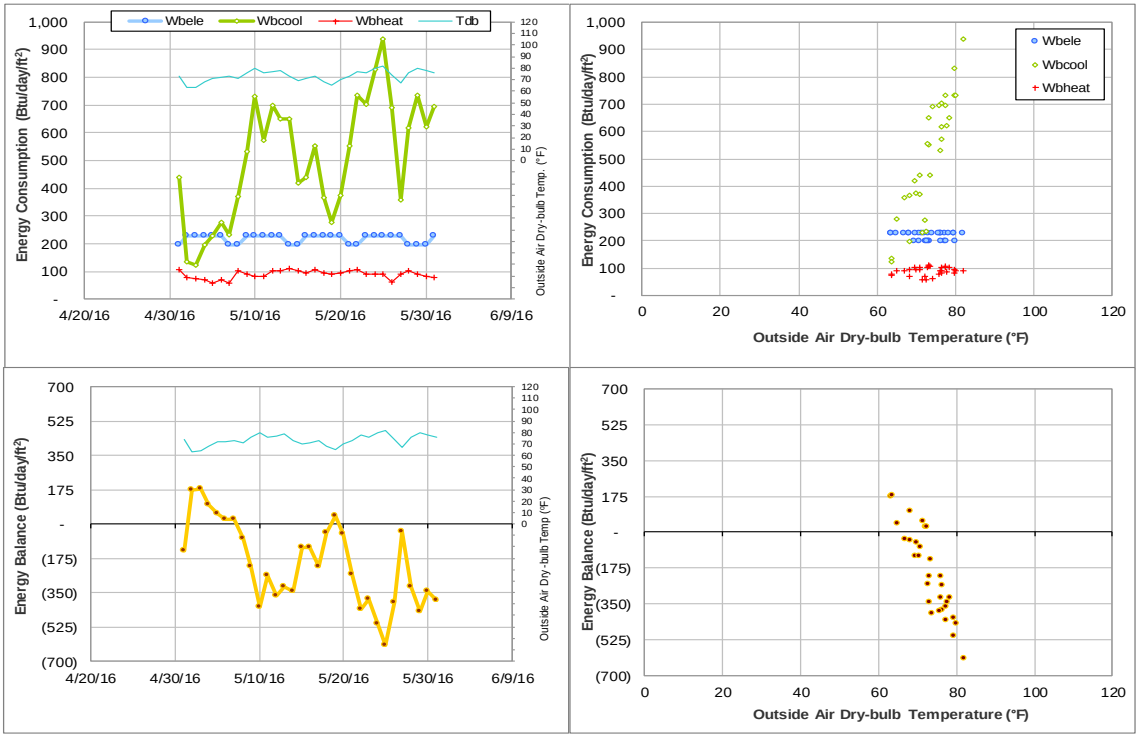


Figure V-27 Office of the State Chemist Building TAMU BLDG # 1810 Energy Balance Plot during May 2016

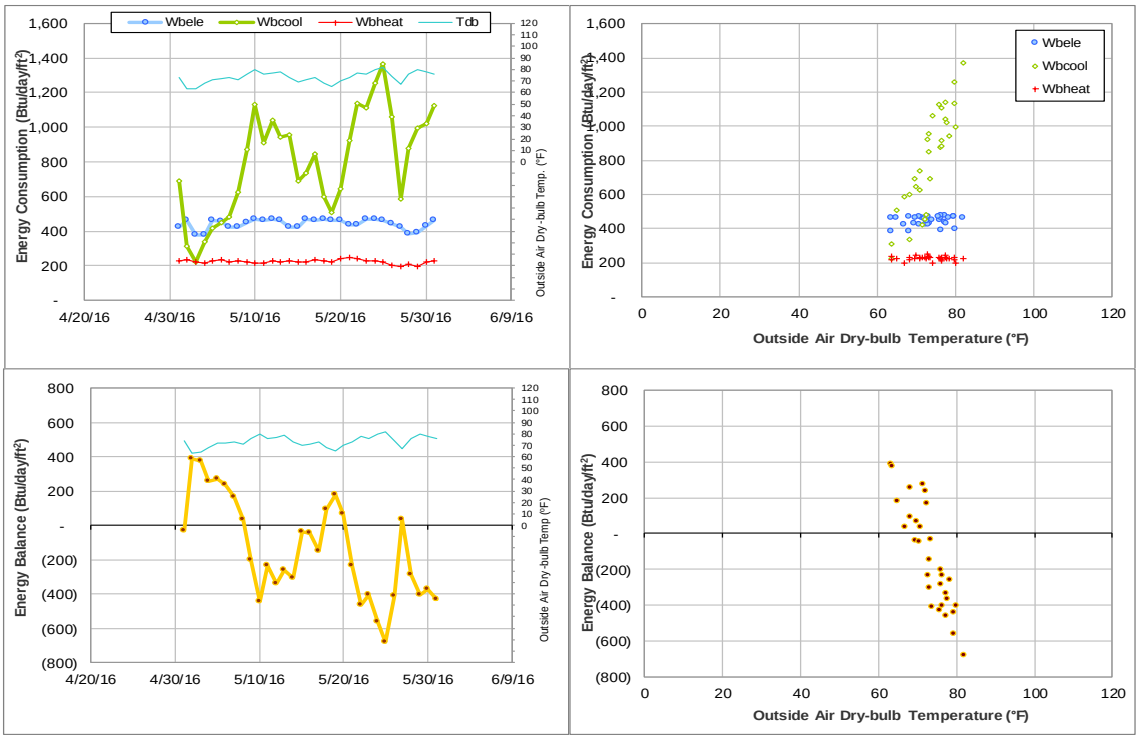


Figure V-28 Vet Med Research Bldg Addition TAMU BLDG # 1811 Energy Balance Plot during May 016

VI. Appendix

ENERGY ANALYSIS GROUP

ENERGY SYSTEMS LABORATORY
TEXAS A&M ENGINEERING EXPERIMENT STATION

Project: TAMU: Energy Analysis*

Report: Energy Consumption Data Quality Assurance/Quality Control Assessment Report for the Month of May 2016

Prepared for:

Utility & Energy Services

Division of Administration

Texas A&M University

Authors: Xiaoli Li, Yifu Sun, Kimberly Jones

Dr. Juan-Carlos Baltazar, and Dr. David Claridge

Date: June 2016

* For information on TAMU project please contact the Team Manager Dr. Juan-Carlos Baltazar